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No. II. OF VOL. I., 1942. LONDON, SATURDAY, JANUARY 10, 1942 Pp. 64—Price 1s.
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CONTENTS

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ORIGINAL ARTICLES

Neurosis simulating Organic Disorder: Cases Analysed — Previous Investigation and Treatment—Disposal.
G. T. COOK, M.D.; WILLIAM SARGANT, M.R.C.P., D.P.M. 31

Assessment of Foot Function: Anatomical and Clinical Considerations: Flat-foot—Eversion and Inversion—Tendon Sheaths—Infection and Usage.
Prof. H. A. HARRIS, M.D. (*illus.*) 32

Natural History of Bright's Disease: Clinical, Histological and Experimental Observations: II.—Essential Hypertension.
Prof. ARTHUR ELLIS, F.R.C.P. 34

Mode of Action of Sulphonamides in Vitro.
SYDNEY D. RUBBO, PH.D., J. M. GILLESPIE, M.SC. (*illus.*) 36

The Dyspeptic Soldier: A Record of 931 Consecutive Cases: Disposal — Malingering — Duration of Service and its Effect.
Lieut.-Colonel WILLIAM BROCKBANK, F.R.C.P. ... 39

Disturbances of the Body Scheme: Anosognosia and Finger Agnosia.
Major JOHN D. SPILLANE, M.R.C.P. 42

Agnosia of Hemiplegia and of Blindness after Cerebral Embolism.
F. PARKES WEBER, F.R.C.P. 44

"Your Teeth": The Problem of Dental Caries: Poor Teeth and Poor Health—Toothbrushes, Natural and Acquired.
E. VAUGHAN TOMEY, L.D.S. R.C.S. 53

Transfusion Sites.
Prof. RICHARD E. STRAIN, M.D. 61

LEADING ARTICLES

STARVING-OUT BACTERIA .. 47
COLD FEET 47
SHOCK AND HÆMORRHAGE . 48
MIDWIVES AND THEIR COLLEGE 49

ANNOTATIONS

A New Blood-grouping ... 50
Cardiac Referred Pain 50
Varicose Ulceration of the Leg 51
Salvage of Paper 51
St. Louis Encephalitis and Equine Encephalomyelitis 51
Honorary Fellowships 52
New Year Honours 52
The Aryan Myth 52

PUBLIC HEALTH

From the Annual Reports: Willenhall—Nottingham 59
Infectious Disease in England and Wales 59

LETTERS TO THE EDITOR

The Future of Medical Research (Mr. Harold Burrows, F.R.C.S.) 57
Fractured Femoral Neck (Prof. Royal Whitman, F.R.C.S.) 57
Regimental Medical Officers (Colonel Letheby Tidy, F.R.C.P.) 57
What's in the Loaf? (Sir E. Graham-Little, F.R.C.P., M.P.) 57
The Christmas Gift: Result (Sir Thomas Barlow, F.R.C.P., F.R.S.) 58
Emergency Medical Service (Mr. S. F. Wilkinson) ... 58
The Stickiness of Platelets (Mrs. Helen Payling Wright) 58
Twining Memorial (Dr. Cochrane Shanks, F.F.R., and others) 58
Volpar Products (Mrs. Marie Stopes, D.SC.) 58
Anæsthetic Flowmeters (Dr. I. W. Magill) 59
"A Contrast" (Miss G. B. Carter, S.R.N.) 59
Disinfectant on Draught .. 59

REVIEWS OF BOOKS

Cancer of the Face and Mouth: Diagnosis, Treatment, Surgical Repair. Vilray P. Blair, M.D.; Sherwood Moore, M.D.; Louis T. Byars, M.D. 46
Handbook of Medical Jurisprudence and Toxicology. William A. Brend, M.D. 46

SPECIAL ARTICLES

New Year Honours 54

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 55

OBITUARY

Captain Clifford Stuart Humphries, M.B. (*with portrait*) 56

MEDICAL NEWS

Service Awards 60
Army Appointment 60
University of London 60
Royal College of Surgeons of England 60
Society of Apothecaries of London 60
Faculty of Radiologists ... 60
Royal Society of Medicine. 60
National Health Insurance 52
Order of the Hospital of St. John of Jerusalem 54
Casualties of the War 56
Vitamins for Finland 56

NOTICES

The Hayes Splint (*illus.*).. 62
Pictorial Hygiene in the Army (*illus.*) 62
Melanoma of the Tonsil ... 61

Appointments—Births, Marriages and Deaths .. 60

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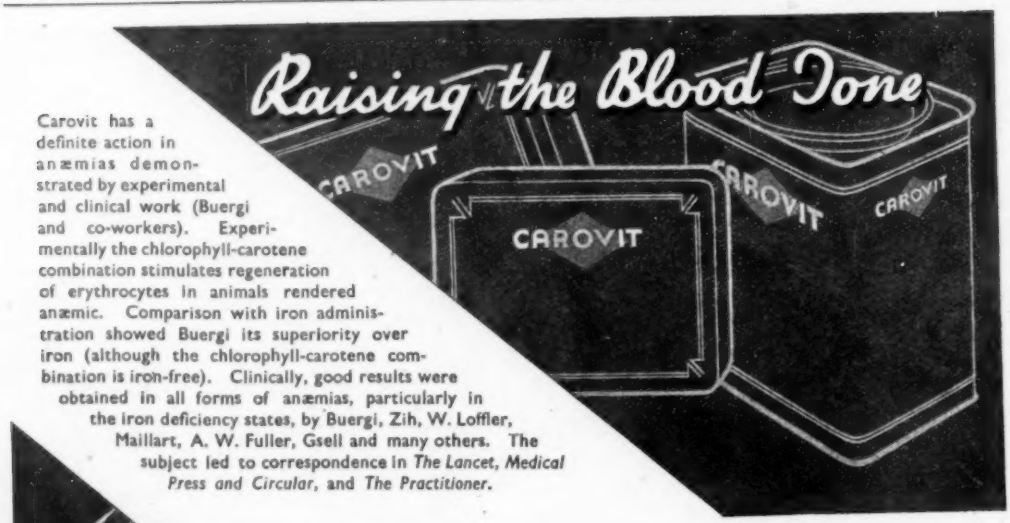

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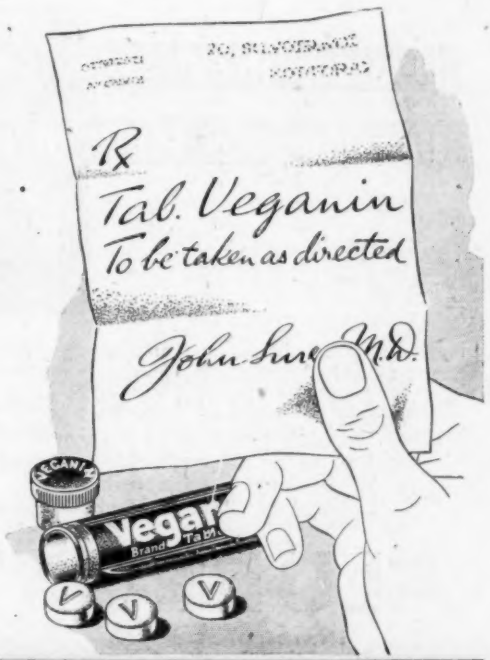

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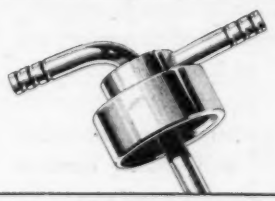

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ORIGINAL ARTICLES

NEUROSIS SIMULATING ORGANIC DISORDER

G. T. COOK, M.D. CAMB.
PHYSICIAN TO AN E.M.S. BASE HOSPITAL

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DEPUTY CLINICAL DIRECTOR OF AN E.M.S. NEUROLOGICAL UNIT

FOR years the trend of teaching in medicine has been to diagnose neurosis by the exclusion of organic disease rather than by the presence of positive signs of neurotic illness. This negative approach to diagnosis may save a few cases from being mislabelled neurotic, with the possible postponement of necessary physical treatment, but the converse is much more often true. In very many neurotic patients the real nature of the illness is overlooked; attention is focused on the somatic aspect, to the patient's detriment; and months or even years may be spent in fruitless attempts to secure benefit by a mistaken form of treatment.

This paper analyses the findings in fifty Service patients admitted for investigation to an E.M.S. base hospital from neighbouring Army units and found by us to be suffering from neurotic illness. All of them had been admitted with organic labels or symptoms, and no mention was made of neurosis by the unit medical officers in their referral notes. If neurosis had been suspected originally, the patients could have been sent direct from their units to the command psychiatrist for disposal and much time and expense saved thereby. The procedure we adopted was to make specific inquiry for positive evidence of neurosis as soon as preliminary physical examination had revealed nothing sufficient to account for their symptoms, but physical investigations were fully carried out where indicated—e.g., all cases of abdominal pain received barium meal X ray and many had a test-meal and gastroscopy, all cases of physical injury other than head injury were seen by the orthopædic specialist, and so on.

Diagnostically doubtful cases have been excluded from this series, as has been any patient in whom the possibility of neurosis was mentioned by the unit medical officer in his referral notes. Otherwise it represents a consecutive series of positive cases seen over a period of twelve weeks. Of the fifty patients, thirty-four had been admitted to medical wards and comprised 20% of all general medical admissions to the hospital during that period. Before this system was instituted, many of these patients would simply have been returned to their units marked "nil organic found," since the initial diagnoses indicated that they were not obviously neurotic; what their subsequent history would have been is suggested by the facts given below. The system has been in operation for nearly a year in this hospital, and such a consecutive series was finally collected and analysed because of the interesting facts that were being revealed—facts that have been hard to come by in the past because psychiatrists rarely gain admission to medical and surgical wards in a consulting diagnostic capacity; their rôle is usually to dispose of or treat the patient when the diagnosis has already been made, as was previously the practice in this particular hospital.

CASES ANALYSED

The fifty cases analysed were all Service patients, ranging in age from 19 to 50; twenty-nine of them were under 30 years of age. Twenty-six of the patients were conscripts and there were twelve volunteers, the rest being made up of territorials and reservists, with only one regular soldier in the group. Only nine of them had undergone any severe military stress, such as the retreat from Dunkirk or very heavy bombing. The table gives the frequency and type of organic symptoms present on admission, contrasted with the final psychiatric diagnoses. As a rule the psychiatric symptoms were mixed, and placing them in any group was a matter of picking out the predominant findings—for instance, many of the mental defectives also had anxiety and hypochondriacal features. Besides the neurotic signs and symptoms presenting themselves in every patient, forty-two out of the fifty patients had a positive family history of neurotic predisposition or severer mental disorder in one or more first-degree relatives, thirty-nine had significant early neurotic traits in childhood, forty had evidence of various degrees of psychological abnormalities in their previous personality, ten had had previous nervous breakdowns in civil life or had been attending at a hospital for nerves over a period of several months. A high proportion of the patients had a low intelligence or actual mental defect. Twenty-four patients failed to reach Standard 7 on leaving school, of which fifteen finished in Standard 5 or lower. In our experience, mental defectives are outstanding for the persistent and confusing organic symptomatology that they produce under stress.

Organic symptoms on admission	Cases	Final psychiatric diagnosis	Cases
Muscular pains } Weakness }	12	Obsessional states	1
Head symptoms	9	Anxiety states	20
Chest symptoms	12	Hysteria	8
Abdominal symptoms	15	Anxiety hysteria	3
Genito-urinary symptoms	2	Post-traumatic states	2
		Mental defectives	9
		Depression	9
		Psychopathic personality	1

One reason for the discrepancy between the patient's organic complaints and the real psychiatric condition behind them is the neurotic's fear of reporting his nervous symptoms, especially when under military discipline. This fact emerged in our investigations. However, symptoms clearly neurotic in nature were usually easy to obtain if inquired about in a positive way, and in most patients enough could be elicited in half an hour to make the diagnosis certain, once an adequate physical examination and essential tests had been completed. That these positive neurotic findings had not been previously elicited is probably due solely to the fact that medical students are rarely taught how to inquire for them.

PREVIOUS INVESTIGATION AND TREATMENT

We have tried to find out what had happened to this group of patients before they first reached a psychiatrist. We have every reason to think that our figures underestimate rather than exaggerate the true state of affairs. Sixteen patients had not previously reported sick. These were therefore caught early and dealt with promptly. Of the remaining thirty-four patients, twenty-five had been in hospital for the same symptoms once or several times previously. Eight of these patients had between them been in hospital 26 times, spending 96 weeks in hospital and 106 weeks on light duty out of 410 total weeks of service—i.e., about 50% of their service. Eight more patients spent 21 weeks out of 468 weeks of service in hospital and between them reported sick on over 340 occasions during the remaining 447 weeks. Nineteen patients had between them been X rayed 30 times, including 12 barium meals, two barium enemas and two intravenous pyelographies. Seven patients had received physiotherapy, totalling 35 weeks inpatient and 56 weeks outpatient treatment.

DISPOSAL

Twenty-three patients were boarded out of the Army immediately, on psychiatric grounds. Two patients were returned without regrading to their units, with a letter of advice to the unit medical officer about their treatment and disposal. Eight patients were sent to an E.M.S. neurological centre for treatment or special transfer to other branches of the Service where they could be used—e.g., Pay Corps or units more approximating to their work in civil life. Seventeen patients were regraded C before being returned to their units with the suggestion that though they were neurotic they might manage certain types of work in the unit if this could be provided; otherwise they could be referred to the command psychiatrist for disposal. Practically all were regraded C before return to their unit, because the cost and trouble involved in letting such patients be sent abroad to break down and then have to be sent back again is obvious. For we found that, despite the positive neurotic findings given above and the frequent history of illness since entering the Army, no less than thirty

patients out of the fifty were still graded A1 on admission to hospital, thirteen patients were in various categories of B, and only four had been graded C.

CONCLUSION

We believe that a case has been made out for the more frequent employment of diagnostic neuropsychiatric opinion early in the investigation of medical and surgical conditions of any obscurity. Such a procedure, widely adopted, would result in a great saving of hospital expenditure, medical man-power, and specialist investigation. The cost and time spent on this small group of patients alone, both in hospitals and in their units, must have been very large. There is reason to think that a similar situation exists in other parts of the country.

We wish to thank Dr. Louis Minski for stimulating this coöperation between an E.M.S. neurological unit and an E.M.S. base hospital, and Dr. C. E. Anderson, medical superintendent of the base hospital, for allowing this investigation to be undertaken and for providing the necessary facilities.

ASSESSMENT OF FOOT FUNCTION

ANATOMICAL AND CLINICAL CONSIDERATIONS

H. A. HARRIS, M.A. CAMB., M.D. LOND., D.SC. WALES
PROFESSOR OF ANATOMY IN THE UNIVERSITY OF CAMBRIDGE

THE number of cases of men boarded out or transferred to a lower medical category calls for a revision of the prevailing methods of assessing a man's footwork. This is done too often in terms of four degrees of flat-foot, or of certain anomalies such as hallux valgus, hallux rigidus or hammer toes.

A careful history of the foot condition is essential, with special reference to pain, infection, and previous modifications of footwear. The first thing is to examine the gait, then the boot and sock, and thirdly the accessory paraphernalia in the way of loose metal supports inside, or fixed patches on the sole or heel outside. The next thing is to realise that any previous treatment of boot or foot may have been useless or harmful.

The pregnant woman or the waiter carrying a tray leans backward and finds movement downhill difficult. The pedlar and the soldier with a pack on his back leans forward and movement uphill is difficult. To walk uphill with a pack, free dorsiflexion at the ankle is necessary. The movement can be assessed by knee-bending with heel and toe on the ground. The kneecap should be well in advance of the great toe and the angle between the tibia and the horizontal foot about 60°–65°. If the range of this movement is limited the soldier with a pack cannot walk uphill erect, but has to bend forward (fig. 1). Limitation of this movement of dorsiflexion at the ankle may be acquired as a result of injury to the anterior margin of the tibia where it comes in proximity to the neck of the talus. A row of small osteophytes may be seen at this site in the ankle as a result of vigorous knee-bending exercises, vigorous pushing in the scrum, or fencing. The limitation of movement may be due also to the presence of a well-marked transverse ridge on the neck of the talus which prevents the tibia moving forwards on the talus to the usual extent (fig. 2). This anterior talo-tibial region on the lateral radiogram, and the limitation of dorsiflexion at the ankle-joint, must be examined in detail before the condition is attributed to shortening of the tendo Achillis and an operation for lengthening the tendon is suggested. The limitation of movement was mechanical in the case illustrated and therefore all forcible manipulation would have been not only useless but also harmful.

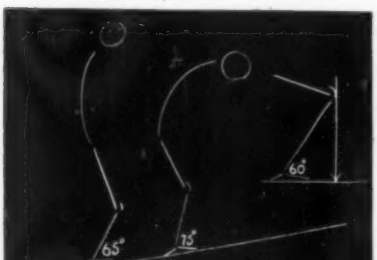

FIG. 1—Result on posture of limitation of dorsiflexion at the ankle-joint, especially when walking uphill. Inset shows how this movement may be assessed with a plumb line or vertical rod.

FLAT-FOOT

The foot may be divided in two ways. The first is to divide it transversely at the midtarsal joint—between the talus and scaphoid medially and the os calcis and cuboid laterally—into posterior and anterior pillars. These two transverse joints are essentially the site of most of the movement of inversion and eversion, and of Chopart's amputation. The posterior pillar is short, strong, simple and designed for the attachment of the powerful tendo Achillis. The anterior pillar is twice as long, delicate, complex, consisting of many bones, many joints, and permitting those gliding movements between the bones which give spring to the forepart of the foot. The other way is to divide the foot into the medial longitudinal arch and the lateral longitudinal arch. The lateral arch consists of the os calcis, cuboid and metatarsals 4 and 5; the medial arch of the os calcis, talus, scaphoid, cuneiforms 1, 2 and 3, with the corresponding metatarsals. The lateral arch is strong, simple and is designed for the main support of the weight of the body in standing. The medial arch is delicate, complex, consists of many bones, joints and critical ligaments, designed for elasticity rather than supporting the weight of the body, and giving the tendons, muscles, nerves and vessels entry into the sole.

The transverse arch is best marked in the line of the tarsometatarsus, and is strengthened by strong interosseous and plantar ligaments to prevent undue splaying or spreading of the metatarsal bones when the weight is thrown forward on to the toes. The critical point in the medial longitudinal arch is the spring ligament running from the sustentaculum tali to the scaphoid. The critical point in the transverse arch is the 3rd cuneiform (and its attached metatarsal) which articulates with six neighbouring bones whereas the other bones of the tarsus articulate with four, except the os calcis which articulates with only two. Both critical points are associated with elasticity and movement rather than with weight-supporting only. The three enemies of elasticity in the tissues and movements of the body are age, infection and malnutrition. As older men are called to the forces so these factors assume greater significance. Notwithstanding the numerous articular surfaces of the 3rd cuneiform, it and its associated metatarsal are the least movable bones in the foot. It is interesting to compare the degree of mobility of the long bones of the hand and foot, for in the hand the mobility is in the decreasing order 1 (thumb), 5, 4, 3, 2; in the foot, 5, 4, 1, 2, 3.

Apart from æsthetics flat-foot, involving either longitudinal or transverse arches, need not be painful and need involve no disability. The pain and disability are often severe during the period of establishment of the condition, but may disappear after it is established, especially if infection is not one of the factors involved. The outstanding exception is the flat-foot associated with gonorrhœa, leucorrhœa or pyorrhœa. I do not intend to discuss flat-foot per se, but rather to dissociate it as far as possible from the first disability of limited dorsiflexion at the ankle, and the other disabilities to be considered.

EVERSION AND INVERSION

The foot of the baby is normally inverted and gradually moves in the first two years of life from the inverted ape-like position to the more everted position. Eversion of the foot, with the sole turned outwards, is one of the late movements to be acquired in the child—much later than the specialised movements of the upper limb, such as supination of the hand and opposition of the thumb. Eversion is necessary to allow walking along the breast of a hill or on the camber of a road. Tall men in particular are easily fatigued if made to march for miles on the edge of the road with one foot everted and the other inverted. The movement takes place mainly at the mid-tarsal '(Chopart's) joint. The muscles producing inversion are essentially the tibialis anticus, tibialis posticus, the long flexors of the toes, and the large muscles of the calf attached to the tendo Achillis.

Eversion is produced essentially by the peronæal muscles, a specialised offset of the extensor group,

FIG. 2—Radiogram of the dorsiflexed foot in a man of 29, treated for flat-foot. The essential disability is limitation of dorsiflexion at the ankle-joint by a bony ridge on the neck of the talus, with tenosynovitis of the tibialis anterior and pain over the lower part of the shin.

peronæus longus, brevis, and to a lesser degree peronæus tertius and the long extensor of the toes. The peronæal muscles are among the last muscles to function in the baby; their nerve-supply, the superficial peronæal or musculocutaneous branch of the lateral popliteal nerve, is one of those nerves which, like the ulnar, lives dangerously. It runs far from its neuronal centre of control in the anterior horn cells of the lumbosacral spinal cord, its course around the neck of the fibula exposes it to repeated injuries, its nutritional arteriæ comitantes are picked up rather haphazardly, and it ends in a peculiarly exposed cutaneous nerve stretching from the mid-point of the lateral aspect of the leg to the dorsum of the foot and toes. When the foot is inverted this nerve stands out like a tendon and is visible through the skin in all subjects except the obese. It is the exposed position of this nerve, easily bruised by an ill-fitting shoe, easily stretched by forcible inversion of the foot, peculiarly susceptible to damp and cold by reason of its lengthy subcutaneous course, which is responsible for the numerous cases of spasm of the peronæal muscles such as Robert Jones often described. In men of 35 and over it is very unlikely that the range of movements of inversion and eversion can be improved by forcible wrenching with such instruments as the Thomas wrench. Moreover, since with advancing age the cross-section of the metatarsals becomes definitely narrower from side to side in proportion to depth, the danger of fracture increases.

In standing it is an advantage to have the feet widely separated at the heel and the two feet directed at an angle of 60° away from each other. In walking it is a disadvantage to maintain the feet at this angulation, for an unnecessary strain is thereby put on the peronæal muscles; when these contract a large hollow depression extends along the lateral aspect of the leg. In marching with the toes turned outwards this hollow is visible; in marching with the toes forward the hollow is barely seen.

TENDON SHEATHS

The development of the tendon sheaths in the hand is determined by the mobility of the metacarpals, so that the mobile thumb and little finger have sheaths continued to the wrist whereas the other fingers have sheaths ending near the metacarpophalangeal joints. For some reason but scanty attention is paid to the tendon sheaths in the foot and ankle, with the result that the significance of localisation of pain in the foot is missed. The tendons in the long flexor sheaths of the fingers are nourished by very small vessels in the mesenteries of the tendons, the vincula longa and brevia. In the foot the long tendons have similar synovial sheaths and similar mesotendons or vincula, but in the case of the tibialis posticus and peronæus brevis there are no mesotendons to guarantee nutrition of a high standard. Thus in any excessive and unaccustomed strain a tenosynovitis of the tibialis posticus and peronæus brevis easily arises. The former throws a load on the spring ligament and the other invertors, the latter on the peronæus longus and other evertors of the foot. Both these give areas of well-circumscribed pain. Similarly after forcible and unaccustomed dorsiflexion of the ankle-joint there is often a tenosynovitis of the sheath of the tibialis anticus with pain radiating up the front of the tibia (painful lower shin). This pain was well-marked in the case described (fig. 2).

Yet another site of deep-seated pain is the tendon sheath of the flexor longus hallucis, which is crossed beneath by the tendon sheath of the flexor longus digitorum at a point virtually below and between the 2nd and 3rd cuneiform bones. This pain is also localised in the length of the two tendons deeply in the sole. The tensile strength of the long tendons of the foot, if regarded as proportional to the cross-section of the tendons or the work done by the muscles concerned, yields an interesting result. The load on the flexor longus hallucis is greater than that on all the other toes together, so that the great toe in man is in a sense overworked.

INFECTION AND USAGE

Examination of the patient and his radiogram is particularly needed when there is a history of pain and infection, especially gonorrhœal. The rôle of infection is often missed, but in such cases a good radiogram will frequently show calcification in the plantar ligaments, deposits in the synovial sheaths and calcification in supernumerary sesamoids. Like the fibrocartilages of the vertebræ, knee, wrist and temporomandibular joint, many structures in the foot are apt to be involved in an infective process: the plantar fascia and the long plantar ligament, often in conjunction with a bony spur of the tuberosity of the os calcis; the thick spring ligament from the sustentaculum tali to the tuberosity of the scaphoid; the groove for the tibialis posticus tendon immediately behind the medial malleolus, lined by glistening fibrocartilage almost hyaline in character; and the similar articular groove on the posterior tubercle of the talus for the tendon of the long flexor of the great toe. Their rate of change of tissue fluid is slow. They are slow in becoming involved in any systemic infection, but once involved they rarely clear up. The foot remains painful. Manipulation and exercise are ineffective.

FIG. 3—Posterior view of the boots of the same patient to show that the routine treatment of raising the inner side of the heel and sole has displaced the weight of the body away from the mid-line. Pain and disability unrelieved and even intensified.

Alterations to boots should be carefully examined. They are often faulty and the routine use of the lengthened heel, crooked heel and metatarsal bar is responsible for much increased disability (fig. 3). Certain peculiar operations, such as working the kick starter on a motor cycle and a stiff clutch on a heavy lorry, produce the characteristic injuries at the ankle-joint already described, for which rest is unfortunately the best available treatment. Small subcutaneous bursæ at pressure points are worth investigating in terms of the boot.

CONCLUSIONS

More care should be taken over footwear, and boots should be made to fit the feet; the feet should not be made to fit the regulation pattern boots—cobbling on live tissues is rarely successful.

Dorsiflexion at the ankle is important in maintaining the upright posture when walking uphill; it becomes more critical as the gradient and the load increase.

Eversion of the one foot, with inversion of the other, is essential for walking along the camber of the road or

the breast of a hill and is fatiguing. The foot in walking should be directed forwards rather than outwards. The typical Army stance throws an unnecessary load on the peronæal muscles.

Tendon sheaths are as important functionally in the foot as in the hand; their extent and bony relationships should be known.

Infection—particularly gonorrhœa, leucorrhœa and pyorrhœa—often involves the plantar fascia, spring ligament and tendon sheaths, especially where the sheaths are in relation to fibrocartilaginous areas on the bones.

Past history and previous special usage of the foot should be carefully analysed. The appearance of the foot is not a reliable guide; function alone counts. In the older recruits manipulation of the foot and violent exercises may be harmful.

NATURAL HISTORY OF BRIGHT'S DISEASE *

CLINICAL, HISTOLOGICAL AND EXPERIMENTAL OBSERVATIONS

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II.—ESSENTIAL HYPERTENSION

THE problem of hypertension and its relation to disorders of the kidney has interested physicians since the time of Bright. Recently new light has been thrown on this age-long problem, first by the recognition of the condition now commonly called malignant hypertension, and secondly by the production of experimental renal hypertension in animals. The knowledge derived from these sources has clarified our conception of the whole group of diseases coming under the general heading of Bright's disease and I propose now to set out the evidence of the relationship of high blood-pressure to disease of the kidney, and to outline the conception of Bright's disease which this new knowledge suggests.

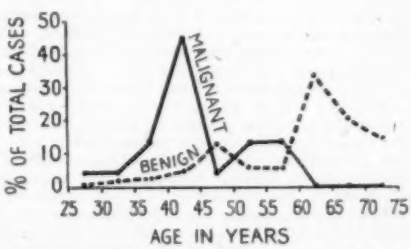
When the occurrence of arterial hypertension was first appreciated its dependence on pre-existing renal disease was assumed. The remarkable observations of Mahomed (1874) † cast the first doubt on the correctness of this view. They were followed by the clinical recognition by Allbutt (1895) in this country and Huchard (1899) in France of hypertension without obvious renal disease. There thus arose the conception of a primary arterial hypertension independent of renal disease, to be distinguished from the secondary hypertension seen in patients with chronic nephritis. To this primary arterial hypertension Allbutt gave the name hyperpiesia, a term which became firmly established in English terminology. In most other countries the condition was known as essential hypertension.

The separation of essential hypertension from chronic nephritis with hypertension marked a great advance in our knowledge of high blood-pressure and its relation to kidney disease. As time went on, however, a difficulty arose. One group of patients with hypertension failed to fit satisfactorily into the new classification—those in whom the clinical course of the disorder suggests a primary hypertension, but in whom signs of renal impairment develop and death in renal failure often occurs. Janeway was perhaps the first clinician to recognise this group of severe cases of primary hypertension terminating in renal failure, but it is to Volhard and Fahr in Germany and to Keith, Wagener and Kernohan, and to Fishberg in America that we owe the general recognition of the condition now generally termed malignant hypertension. In a lecture based on 40 fatal cases of malignant hypertension with necropsy (Ellis 1938) I pointed out that in those patients dying early in the disease both the natural history of the disorder and the histological findings indicate that in the early stages the renal lesions are minimal, and that the earliest histological changes are necrosis and endarteritis of the arterioles not only in the kidneys but in other organs. Fahr (1919) had already recognised these arterial lesions and considered them the cause of the glomerular changes. He attributed them to the action of various toxins—syphilis, lead, rheumatism and other unknown agents. Volhard considered that both the arteriolar and glomerular lesions were due to vascular spasm. Our observations at the London Hospital led us to believe that the glomerular lesions were the result of the arteriolar degenerations and that the latter were a direct result of the hypertension. For this view we have subsequently obtained convincing support from the production by Wilson and Byrom (1939) of exactly similar renal lesions in animals in which hypertension had been experimentally induced.

The recognition of malignant hypertension with its axiomatic acceptance of the view that hypertension can produce lesions in the kidney similar to those seen in chronic nephritis is revolutionary; it is crucial to an understanding of the true nature of chronic Bright's disease. Its significance will be apparent when we come to discuss the effects of hypertension on the kidney in experimental animals. Thus essential hypertension is now considered to occur in two forms: malignant hypertension with a relatively rapid course to death in renal failure; and benign hypertension without obvious renal involvement—the hyperpiesia of Allbutt.

MALIGNANT HYPERTENSION

Our series contains 103 cases, 76 of which are known to have died; autopsy was performed on 50 of these; 7 cases are still under observation and 20 no longer attend the clinic. The age when first seen, in cases where the diagnosis was verified histologically, ranged from 17 to 72. The great majority of the cases (67%) fall between 35 and 55 years of age—that is, they are considerably younger than the age when hypertensive symptoms usually become manifest. This is the common experience. Fahr (1925) noted that while 76% of his cases of benign hypertension were over 60, only 7·5% of those with malignant hypertension were above this age. This difference in the age-incidence of benign and malignant hypertension is well shown in the figure, modified from Kimmelstiel and Wilson (1936). Occasional cases in children have been reported and I have seen the kidneys from a child of 10 in which the appearance was characteristic. In our series there were 69 males and 34 females.



Age-incidence in benign and malignant hypertension. Modified from Kimmelstiel and Wilson (1936).

The *clinical picture* in malignant hypertension is one of rapidly progressing cardiac and renal failure in a previously healthy adult. The common age of onset is between 40 and 50 years. The patient gives no history of preceding renal disease. The usual methods of onset are attacks of headache and vomiting on waking in the morning, or attacks of præcordial pain and breathlessness, or paroxysmal nocturnal dyspnœa, or suddenly failing vision. On examination, the heart and peripheral arteries will be found to be enlarged, often to a considerable degree, the blood-pressure will be high, especially the diastolic pressure which is usually 130 mm. Hg or more; the fundus oculi will show hypertensive retinitis with papilloedema and often hæmorrhages and exudate. In early cases these may be the only abnormal findings, but usually by the time the condition is recognised other signs have developed. Some degree of heart-failure is nearly always present; it occurs in the form of left ventricular failure, giving rise to breathlessness on exertion and paroxysmal nocturnal dyspnœa; there may be moist sounds in the lungs, but peripheral venous congestion and œdema are only rarely seen in the early stages, so that unless heart-failure is suspected the significance of these findings may be overlooked. The urine will probably contain a considerable amount of

* The second Croonian lecture for 1941; not delivered owing to the war.

† References will be found at the end of lecture 3.

albumin, and blood may be present. In contrast to cases of nephritis the urinary deposit usually contains only a few red cells, excess of leucocytes and granular casts being a rare finding. The urinary specific gravity tends to be fixed and renal-function tests will show some nitrogen retention with moderate or severe impairment of concentrating power. In advanced cases there may be great wasting and anæmia, but often these signs are absent. Death with combined renal and cardiac failure will occur six months to two years from the date of the first symptoms.

At autopsy the kidneys will show slight or only moderate contraction. On histological examination, in addition to the lesions of ischæmic atrophy usually present in those who have had high blood-pressure, focal glomerular lesions are found in the form of acute focal necroses often leading to adhesions between capsule and tuft, fibrinoid necrosis of individual capillary loops, increased cellularity, often focal, affecting a single lobule of a glomerular tuft, and varying degrees of capsular proliferation with occasional true crescent formation. The tubules show a severe albuminous degeneration, and hyaline droplet degeneration is almost always present in occasional tubules. The interstitial tissue shows varying degrees of fibrosis and cellular infiltration. The vascular lesions are important and are constantly present. There is necrosis of the walls of many arterioles, particularly the afferent arterioles to glomeruli. These are enormously swollen owing to the deposition or imbibition of material which is dark purple in sections stained with hæmatoxylin and eosin—the so-called fibrinoid necrosis. This swelling of the wall may lead to apparently complete obliteration of the lumen. There are in addition loss and fragmentation of nuclei, and frequently red cells in the vessel walls; proliferative changes in and about the vessels also occur. The smaller arteries, particularly the interlobulars, show an almost constant lesion in the form of so-called endarteritis fibrosa; this is a relatively richly cellular thickening of the intima, often leading to gross narrowing of the lumen and easily distinguished from the intimal thickening with increase of elastic tissue found in all cases of hypertension. These vascular lesions are not confined to the kidney. They occur in other organs, particularly the adrenals, pancreas, and intestine, more occasionally in liver, stomach, prostate, testicle (Ellis 1938).

NATURAL HISTORY

It is apparent, then, that the end stage of this condition and of chronic type 1 nephritis are very similar. Indeed, if the patient is not seen till late in the disease it may be difficult to settle the diagnosis between these conditions. The histological changes described above were formerly considered characteristic of nephritis and these patients were then regarded as typical examples of chronic interstitial nephritis. If we turn to the early stages of the condition the situation is different; for though hypertension is severe and papillœdema present, clinical and histological evidence of renal involvement may then be slight or almost absent. For example, the concentrating power of the kidney may be well preserved, the blood-urea within normal limits, and other tests of renal function satisfactory. Albumin may even be absent from the urine, and in cases dying early from non-renal causes histological lesions in the kidney scanty. If special attention is paid to examination of the fundus oculi in all patients with hypertension many more cases of malignant hypertension are seen in the early stages. Several such cases were reported in my previous paper and since then our experience has been extended. Out of the present series of 103 cases of malignant hypertension albumin was absent from the urine in 10 when first seen. In 26 cases there was only slight albuminuria and the renal-function tests were normal. We have examined the kidneys in 12 cases which died in this early stage from a non-renal cause such as cerebral or subarachnoid hæmorrhage, cardiac infarction or failure. None of these kidneys showed extensive damage, the renal parenchyma was well preserved and in some the lesions were so scanty that only careful search revealed them. The earliest lesions appeared to be arteriolar necroses. Even when lesions were minimal in the kidneys, acute arteriolar lesions were found in other organs.

In spite of this scanty renal damage in the early stage the course is rapidly progressive, the patient usually dying from a combination of renal and cardiac failure. Heart-failure plays a prominent part in this rapidly progressive course, and even though death occurs in uræmia, nitrogen retention is usually less well marked and of shorter duration than in other forms of renal disease. This is in accord with the absence of severe renal contraction in malignant hypertension and the histological finding of many well-preserved and apparently healthy glomeruli.

Malignant hypertension, therefore, may be viewed as a primary essential hypertension associated with widespread acute vascular lesions leading to rapidly developing renal and cardiac failure.

Complications.—Hypertensive encephalopathy, with convulsions and often with severe mental disturbance, severe bouts of headache and vomiting due to increased intracranial pressure, cerebral or subarachnoid hæmorrhage, and cardiac infarction and failure may arise at any stage of the disease.

PROGNOSIS, DIAGNOSIS AND ÆTIOLOGY

The prognosis is extremely grave. Death usually occurs within a year of the appearance of papillœdema; often it is even more rapid and we have seen only one patient who has survived for more than two years after the diagnosis was established. Recovery in our experience does not occur, but we have several patients under observation in whom the papillœdema has disappeared after long rest in bed with accompanying symptomatic improvement. In one of these the papillœdema disappeared after lumbar sympathectomy.

The diagnosis of malignant hypertension should, in my opinion, never be made in the absence of papillœdema; this sign distinguishes malignant hypertension from benign hypertension. The cause of the papillœdema is increased intracranial pressure but the mechanism by which the increase is produced is far from clear. Fishberg (1939) believes it to be due to cerebral œdema caused by failure of the cerebral arterioles to contract adequately, this producing an increased pressure in the brain capillaries with resulting increased transudation. It must be emphasised that papillœdema and the other signs of hypertensive retinitis are also seen in other types of chronic Bright's disease with hypertension—for example, type 1 and type 2 nephritis and chronic pyelonephritis—but in these conditions renal failure is always far advanced before the papillœdema appears. If a patient with malignant hypertension is not seen until late in the disease, when renal failure has developed, differential diagnosis from chronic type 1 nephritis may be difficult or impossible and occasionally this differentiation cannot even be made histologically. In some cases of malignant hypertension with severe cerebral symptoms and little or no evidence of renal involvement the differential diagnosis from brain tumour may be very difficult. We have occasionally seen cases where painless hæmaturia has been the only symptom and such patients have been thought to be suffering from surgical disease of the kidney. Examination of the optic fundus is sufficient to establish the diagnosis.

Fahr suggested that the vascular lesions in malignant hypertension are the result of a toxin, while Volhard holds that they are due to vascular spasm caused by a circulating pressor substance. Fishberg, on the other hand, considers malignant hypertension merely a severe essential hypertension occurring in a young person—a giving way of the arterioles under a high diastolic pressure. Our experimental results show that there is support for Fishberg's views in the fact that in the rat a well-marked and rapidly developing hypertension gives rise to lesions similar to those seen in malignant hypertension in man.

I have already pointed out that malignant hypertension develops before the age at which essential hypertension usually appears; and in our experience it is unusual to get a long history of preceding hypertension or of hypertensive symptoms in patients with malignant hypertension. This suggests that we are not dealing with an end-result in a long-standing preceding hypertension. Such cases do however occur; occasionally a patient is seen who is known to have had hypertension for many years, and who then develops papillœdema and

signs of renal involvement with a rapidly downhill course to death in cardiac and renal failure. These patients tend to be older than the ordinary case of malignant hypertension, and the condition appears to be the imposition of a "malignant termination" on a previously benign hypertension. They seem to be quite different from most patients with malignant hypertension in whom the disease runs a more rapid course.

Malignant hypertension may also be associated in some patients with Cushing's syndrome (pituitary basophilism), in which the presence of other symptoms makes it possible to follow the development of the hypertension from its early stages—an opportunity otherwise rare. It is in these cases, therefore, that we can best follow the rapid course of the disease. I shall deal later with the effects of renal ischæmia and the theory of a vicious circle in Bright's disease which has resulted from the animal experiments of Wilson and Byrom. It would seem that such mechanisms are intimately concerned in the ætiology of malignant hypertension. I must therefore postpone further discussion of this question until I come to these experimental observations.

BENIGN HYPERTENSION

The clinical features of benign hypertension—the hyperpiesia of Allbutt—are familiar, and I therefore propose to confine my further remarks on essential hypertension to three aspects: the prognosis in benign hypertension; the question whether malignant hypertension is the only form of severe renal lesion occurring in essential hypertension; and the pathogenesis of essential hypertension.

Prognosis.—One important result of the recognition of malignant hypertension is its effect on our attitude to prognosis in benign hypertension. I am firmly of the opinion that the usual outlook on this disorder is much too gloomy, largely because our outlook is dominated by the dramatic downward course in malignant hypertension. When the cases are considered separately we appreciate that benign hypertension runs a comparatively favourable course. While it is true that many of these patients develop cardiac failure or suffer a cerebral catastrophe it is also true that many live for years with well-marked arterial hypertension without complaining of symptoms; they may even live to old age and die of unrelated afflictions without ever being seriously affected by the arterial hypertension. The importance of these considerations is obvious when it is realised that nearly all patients with hypertension belong in the benign group—more than 90% according to Fishberg. I should place the figure even higher, for though we have been particularly interested in malignant hypertension we have seen, during the past five years, only 56 examples. Far too severe restrictions are imposed on patients with benign hypertension. There is little evidence that such restrictions have any permanent effect on the course of the disease, but they severely limit the happiness and usefulness of the patient and at times give rise to an anxiety state more disabling than the disease itself. The regimen prescribed for the patient with benign hypertension should depend not on the degree of hypertension but on the presence or absence of evidence of cardiac enfeeblement. Two further precepts concerning prognosis in benign hypertension are generally recognised; first, that women will withstand prolonged high blood-pressure for much longer periods than men; secondly, that the older the patient is at the time when hypertension becomes manifest the more favourable is the prognosis.

OTHER FORMS OF RENAL LESIONS IN ESSENTIAL HYPERTENSION

Fishberg (1939) considers that in older subjects there are occasional cases in which renal arteriosclerosis resulting from prolonged high blood-pressure leads to such extensive renal atrophy that renal failure results. These kidneys show purely atrophic lesions, and no "reactive changes in the glomeruli." We have seen kidneys which appeared to belong in this group, but in our experience they were very rare—perhaps because the number of old people in our material was small. We have, however, seen a few patients, mostly women, who had what appeared to be essential hypertension but in whom renal failure developed; and histologically the kidneys showed a "chronic interstitial nephritis." These cases differed from malignant hypertension in that they ran a chronic course and papilloedema was never seen. Histologically the acute lesions of malignant hypertension were lacking, the renal changes corresponding with those described by Wilson and Byrom (1941) in rats with chronic hypertension. We therefore suspect that, in addition to the relatively acute course of malignant hypertension, a chronic form of renal disease can arise as a result of essential hypertension. It does not, however, seem to be very common.

PATHOGENESIS OF ESSENTIAL HYPERTENSION

The experiments of Goldblatt and his colleagues (1934), who constricted the renal arteries of dogs, have shown that diminished blood-flow through the kidneys gives rise to sustained hypertension. These important observations have provided a likely explanation for the occurrence of hypertension in kidney disease. There is a tendency at present to infer from this that all hypertension—including essential hypertension—is due to primary renal ischæmia. The cause of renal ischæmia in essential hypertension is claimed by those who hold this view to be renal arteriosclerosis. This argument has one obvious weakness; if we accept it we must suppose, as Fishberg has pointed out, that the renal arteriosclerosis is both the cause and the result of the hypertension. There is the following convincing evidence that renal arteriosclerosis is produced by hypertension: (1) that, broadly speaking, the longer standing the hypertension the greater the degree of renal arteriosclerosis (Turnbull 1915); (2) that in malignant hypertension the arteriolar lesions in the kidney are minimal in the early stages and severe in the later stages; (3) that if hypertension is produced in a rat by clamping one renal artery, arteriolar lesions will appear in the unclamped kidney owing to the hypertension, but will be absent in the clamped kidney which is protected from the hypertension by the clamp on its renal artery. If the presence of arteriosclerosis in the kidneys of patients with essential hypertension is to be expected as the result of the hypertension, it cannot be convincingly advanced as the cause. The problem still remains open and the evidence that essential hypertension is due to primary renal vascular lesions is at present insufficient. It is quite possible of course that the mechanism of production of essential hypertension is renal ischæmia, but if this is so it seems more probable that the renal ischæmia is at first functional, being due to some extra-renal factor, and is only later aggravated by renal arteriosclerosis.

MODE OF ACTION OF SULPHONAMIDES IN VITRO

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IT is now generally accepted that the inhibitory effect of sulphanilamide on bacterial growth is due to "interference" with the function of the *p*-aminobenzoic acid and structurally similar groupings of the bacterial cell (Woods 1940). Hence, Fildes (1940) in enunciating his hypothesis on "a rational approach to chemotherapy" suggested that *p*-aminobenzoic acid behaved as an essential metabolite for bacterial growth—that is, a substance or chemical group which plays an essential part in a chain of synthesis necessary to convert non-living nutrients into living bacterial protoplasm. Thus, *p*-aminobenzoic acid is now regarded as an essential metabolite—but only on the indirect evidence of its capacity to counteract the bacteriostatic action of sulphanilamide.* Before the conception of bacterial inhibition by "interference" can be widely accepted it still remains to be proved that the metabolite (*p*-aminobenzoic acid in the present discussion) is essential for the growth of an organism susceptible to sulphanilamide. The main difficulty in demonstrating the essential rôle of *p*-aminobenzoic acid is that the organism which requires the acid

* The authors have not seen a proof of this article. Since it was written other evidence has become available (see Blanchard, K. C. *J. biol. Chem.* 1941, **140**, 919).

as an essential metabolite is capable of synthesising it from the nutrients supplied in the medium. However, this difficulty has been entirely removed by the observation of Rubbo and Gillespie (1940) that *p*-aminobenzoic acid is something more than an essential metabolite—namely, a bacterial growth factor which must be present in the medium before growth of certain organisms can take place.

In a study of the bacteriology of the organism responsible for the industrial production of butyl alcohol and acetone by fermentation it was found that the organism, *Clostridium acetobutylicum* (W), required traces of *p*-aminobenzoic acid in a medium of known chemical constitution for growth to occur (Rubbo and Gillespie 1940, Rubbo et al. 1941). This was the first recorded observation of *p*-aminobenzoic acid acting as a bacterial growth factor. Since then it has been claimed (Ansbacher 1941) that the acid is probably one of the factors of the vitamin-B complex acting as a chromotrichia factor for the rat and a growth-promoting factor for the chick.

The present report deals with the inhibitory effect of four well-known sulphonamide drugs—sulphanilamide, sulphapyridine, 'Soluseptasine' and 'Proseptasine' (M&B) on the growth of *Cl. acetobutylicum* (W), and the reversal of this inhibition by increasing amounts of growth factor, *p*-aminobenzoic acid. The results fully confirm Woods's findings with hæmolytic streptococci and extend his observations to a wider range of sulphonamides. In view of this it would be more correct to speak of the anti-sulphonamide, rather than the anti-sulphanilamide action of *p*-aminobenzoic acid.

Experimental

Two strains of *Cl. acetobutylicum* (W) were used, one (No. 862) being obtained from the American Type Cultures Collection while the other was isolated in this department. As both behaved similarly in all experiments they will not be distinguished further. The preparation of the basal synthetic medium containing *p*-aminobenzoic acid has already been described (Rubbo et al. 1941), and also the technique of inoculation, anaerobic incubation and so on. The sulphonamides were dissolved in water to give a concentration of 3×10^{-2} molar and were sterilised by filtration through a Seitz asbestos E.K. filter; 1 ml. of this solution was added to 10 ml. of synthetic medium, thus giving a final sulphonamide concentration of $3{\cdot}3 \times 10^{-3}$ M. Each experiment was performed in duplicate with both strains of the organism and the type of growth noted after 48 hours' incubation at 37° C. The results are shown in table I.

TABLE I

Experiment	Concentration of sulphonamide M/3300	Amount of *p*-aminobenzoic acid per ml. of basal medium (μg.) 0·00001	0·0001	0·001	0·01	0·1	1	10
1	Control without drug	−	+	+	+	+	+	−
2 A	Sulphanilamide	−	−	−	+	+	+	−
2 B	Sulphanilamide	−	−	−	+	+	+	−
3	Sulphapyridine	−	−	−	+	+	+	−
4	'Soluseptasine'	−	−	+	+	+	+	−
5	'Proseptasine'	−	−	+	+	+	+	−

Growth +; no growth −.

Expt. 2: A, inoculum of vegetative cells; B, inoculum of sporing forms.

Experiment 1, table I illustrates the growth-factor capacity of *p*-aminobenzoic acid which, in a concentration of 0·0001 μg. per ml., was sufficient to permit growth of the bacterium. On the other hand, higher concentration of the growth factor, for instance 10 μg. per ml., inhibited rather than stimulated growth. This is considered consistent with the common biological phenomenon that a substance may stimulate growth of cells in high dilution but may be toxic in stronger concentrations. Such a finding suggested the possibility that sulphanilamide might stimulate growth on extreme dilution, but experiment showed that it was inactive from this point of view (Rubbo and Gillespie 1940). In experiments 2, 3, 4 and 5 it will be seen that while the sulphonamide drugs used were bacteriostatic in the presence of minimal concentrations of growth factor, this bacteriostasis was removed on increasing the concentration of the factor ten- to a hundred-fold. Sulphanilamide and sulphapyridine appeared to be more toxic towards the bacterium, since quantitatively more *p*-aminobenzoic acid was required to reverse their inhibitory effect than was required for soluseptasine or proseptasine. Spores of this bacterium were found to be just as susceptible to sulphanilamide as were the vegetative cells (experiments 2A and 2B).

The results recorded in table II describe a "titration" experiment in which varying amounts of *p*-aminobenzoic acid were added to tubes of basal medium containing different concentrations of sulphanilamide. The object of this experiment was to determine quantitatively the amount of growth factor necessary to remove the inhibitory action of the drug.

TABLE II

Concentration of sulphanilamide		Amount of *p*-aminobenzoic acid per ml. of basal medium (μg.)					Ratio of sulphanilamide: *p*-aminobenzoic acid by weight
Molar	μg. per ml.	0·0005	0·001	0·002	0·003	0·004	
M/6600	26	−	+	+	+	+	26,000
M/3300	52	−	−	+	+	+	26,000
M/1650	104	−	−	−	−	+	26,000

Growth +; no growth −.

The findings reveal a remarkable disproportion, weight for weight, between the amount of *p*-aminobenzoic acid and that of sulphanilamide inactivated. As will be seen 0·001 μg. of *p*-aminobenzoic acid antagonises 26 μg. of sulphanilamide—i.e., 1 part by weight antagonises 26,000 parts of drug. Similarly, if the concentration of inhibitor is increased twofold or fourfold a proportionate increase of growth factor is necessary to permit growth of the organism. The importance of this quantitative relationship will be discussed later.†

DISCUSSION

The following facts have been established:—

1. *p*-aminobenzoic acid is a bacterial growth factor for an anaerobic bacillus, *Cl. acetobutylicum* (W).

2. The growth of this organism in vitro is inhibited in the presence of sulphonamide drugs.

3. The bacteriostatic action of the sulphonamides is removed by increasing the concentration of growth factor ten- to a hundred-fold above the amount necessary to promote growth.

4. One part by weight of *p*-aminobenzoic acid reverses the bacteriostasis caused by 26,000 parts by weight of sulphanilamide.

The broad aspects of these findings are mainly concerned with providing experimental evidence for Fildes's hypothesis of a rational approach to chemotherapy. Of the three classes of bacterial inhibition postulated by Fildes (1940), that which involves a competition by the inhibitor for an enzyme associated with the essential metabolite is well illustrated here.

Cl. acetobutylicum (W) is an organism rather more peculiar in its nutritional demands than most bacteria, in that it is unable to grow in laboratory media unless supplied with *p*-aminobenzoic acid and a fermentable sugar. Therefore, *p*-aminobenzoic acid must be regarded as a growth factor for the bacterium rather than an essential metabolite. The cultivation of the organism in a medium of known chemical constitution made it possible to study the mode of action of sulphanilamide under conditions uncomplicated by unknown factors, such as constitution of the medium and nutritional requirements of the organism.

In regard to the relation of chemical structure to the "rational approach" hypothesis it is noteworthy that the chemotherapeutic agent and the growth factor are structurally related compounds, being 1:4 derivatives of benzene. This relationship suggests a mechanism of bacteriostasis largely determined by chemical structure. In support of this conception we might compare the findings of Woods (1940) with those of Rubbo and others (1940, 1941). Although these two groups of workers were primarily concerned with widely separated problems the results have certain features in common. In

† A similar table has been published in *Nature* (Rubbo and Gillespie 1940) with some *errata*, owing to a lack of proof-reading; the present table II is the correct record of the results.

the first place, they were dealing with organisms whose growth was inhibited by sulphanilamide, and secondly, this inhibition was reversed in the presence of *p*-aminobenzoic acid.

The findings illustrated in fig. 1 reveal a striking correlation between anti-sulphanilamide ratio on the one hand and growth-factor activity on the other. It will be seen that *p*-aminobenzoic acid (2), *p*-nitrobenzoic acid (4), procaine (6), and *p*-aminobenzamide (7), are equally active as growth factors and as anti-sulphanilamide agents. Furthermore, all these substances conform to the 1:4 di-substituted benzene ring structure. As it has been shown by Rubbo and others (1941) that *p*-aminobenzoic acid is formed from *p*-aminobenzaldehyde by oxidation, from *p*-nitrobenzoic acid by reduction, and from procaine by hydrolysis, there is no essential difference in function between these compounds and *p*-aminobenzoic acid. Again, the inactivity of the substances 10 to 15 in fig. 1 is consonant with the supposition of specific interference. It is interesting to note that when compared with the *para* acid, the *ortho* and *meta* aminobenzoic acids (8 and 9) are practically devoid of growth-stimulating properties (Rubbo et al. 1941) and equally of anti-sulphanilamide action (Woods 1940). It is also well known that the *ortho* and *meta* isomers of sulphanilamide are devoid of chemotherapeutic activity. Thus it appears that, in the present discussion, the structural configuration of a chemotherapeutic agent must conform to the structural pattern of an essential growth factor or metabolite for the organism. Such an idea of specific inhibition determined by chemical configuration is illustrated in fig. 2.

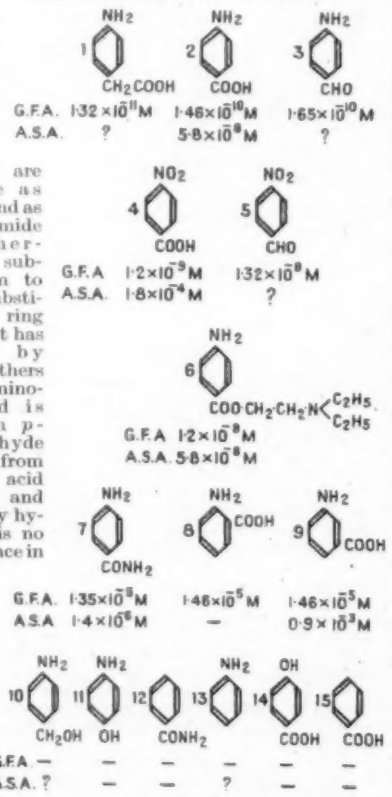

FIG. 1—Findings of Rubbo and others (1940, 1941) and of Woods (1940), showing correlation between growth-factor activity (G.F.A.) and anti-sulphanilamide activity (A.S.A.).
— indicates substance inactive at 10^{-3} M.
? " " not tested.

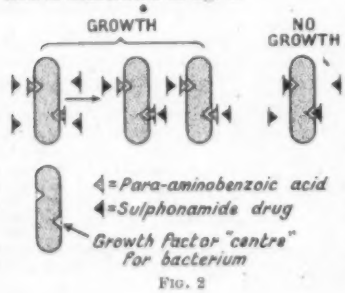

FIG. 2

One outstanding exception to this remarkable correlation is worthy of mention. Although *p*-aminophenylacetic acid (1 in fig. 1) was the most active growth factor of the series tested, it was found (by experiments which have not been described) to be devoid of any anti-sulphanilamide action. This finding has also been confirmed by Landy and Wyeno (1941) who reported that the acid was not an anti-sulphanilamide agent. As a corollary to what has already been said it is anticipated that *p*-aminophenylmethanesulphonamide, which bears the same relationship to *p*-aminophenylacetic acid as sulphanilamide to *p*-aminobenzoic acid, will function as a bacteriostatic agent towards *Cl. acetobutylicum* (W), and possibly towards other organisms insensitive to sulphanilamide—*Streptococcus fæcalis* and *Cl. œdematiens*. It has been reported (Miller et al. 1940) that this substance did not exhibit any significant protective action against experimental streptococcal infections in mice on the administration of a single dose of the compound. An approach similar to that described above was adopted by McIlwain (1940), who demonstrated that the growth of proteus and staphylococcus is inhibited by pyridine-3-sulphonic acid when the organisms were cultivated in a medium containing nicotinic acid (pyridine-3-carboxylic acid) as the growth factor.

The quantitative ratio of the amount of sulphanilamide inactivated by *p*-aminobenzoic acid is important. It has been shown that the ratio is approximately 26,000:1—that is, 26 g. of sulphanilamide is inactivated by 1 mg. of *p*-aminobenzoic acid. Two interpretations of this tremendous disproportion seem to be open to us. First, it might be assumed that *p*-aminobenzoic acid has a greater affinity for the organism than sulphanilamide, and thus can displace the latter even after contact has been made with the specific enzymic "centre." Secondly, it is possible that some organisms receive chance protection by *p*-aminobenzoic acid (roughly 1 in every 26,000); and that these few survivors account for the growth recorded after 48 hours' incubation.

MacLeod (1940) has demonstrated that extracts of normal and autolysed tissues, pus, and certain sterile serous effusions (secondary to acute rheumatic fever) possess anti-sulphanilamide properties, while blood-serum, fresh kidney and liver are inactive. These findings, taken in conjunction with our own, seem to indicate that local application of sulphanilamide (or sulphonamides generally) to infected wounds is a wasteful procedure in which the effectiveness of the drug is tremendously reduced by traces of active inhibitors present in the damaged tissue and pus. Accordingly, the surgical rationale of packing wounds with at least 10 g. of the drug when only traces are required in the serum to treat septicæmic infections might be explained on this basis. The results of local sulphonamide therapy do not appear so remarkable when it is considered that in experimental wound infections with gas-gangrene organisms Hawking (1941) stated that 0·1% solution of proflavine achieved a similar result to that obtained with solid sulphathiazole. While we do not wish to cast suspicion on the efficacy of local sulphonamide prophylaxis, the fact that only traces of *p*-aminobenzoic acid and related compounds, which are probably present in damaged tissue, are capable of destroying its action is worthy of serious consideration.

The results of this investigation have direct bearing on the conclusions of Fildes, in that the antibacterial substance, sulphanilamide, specifically interferes with the normal function of the growth factor of the cell, *p*-aminobenzoic acid. His remark that "chemotherapeutic research might reasonably be directed to modification of the structure of known essential metabolites to form products which can block the enzyme without exhibiting the specific action of the metabolite" seems to be justified by these experiments.

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THE DYSPEPTIC SOLDIER

A RECORD OF 931 CONSECUTIVE CASES

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WAR had not been long declared before it was realised that the medical services of the Army were facing a problem which had caused no particular anxiety during the war of 1914–18. In that war the headings "indigestion," "inflammation and ulceration of the stomach" and "other diseases of the stomach" occupied the eleventh, twelfth and ninth places in the order of incidence of diseases, being preceded by rheumatic fever; disorders of locomotion; diseases of the respiratory system, of the intestines, of the nervous system and of the skin; venereal disease; and influenza (Willcox 1940). The intervening years had brought to this country a vast increase in incidence of dyspepsia and in particular of gastric and duodenal ulceration, and it was this increase that was responsible for the trouble. It has been recorded that a firm of retail chemists who own about a dozen shops in an industrial area sell half a ton of alkaline powder to their customers in a month (Turner 1941).

Various figures have been given of the present incidence of dyspepsia in the Army. During the period between the dispatch of the B.E.F. to France and April 29, 1940, 12·5% of all cases sent home to the United Kingdom had a primary diagnosis of gastric or duodenal disease (Payne and Newman 1940). If the emergency evacuation of the base hospitals (when even minor illnesses were sent home) is excluded the figure is 14·4%. This represents only a portion of the total dyspeptic cases in the base hospitals in France, but even so the figure is much higher than that for cardiac cases, for example. Payne and Newman investigated 287 of these evacuated cases in which a primary diagnosis suggested a gastric or duodenal lesion and their figures of positive findings are necessarily high; they found that 89% had gross organic disease.

TABLE I—ADMISSIONS IN EIGHTEEN MONTHS

Month	Patients admitted	Number dyspeptics	% of total admitted	% of dyspeptics returned to duty without X-ray exam.	% dyspeptics proved organic	Number ulcer cases †	% of ulcer cases		
							Gastric	Duodenal	Pyloric
1939									
Sept.	475	46	10	32·5	37	17	35·3	47	17·6
Oct.	776	51	6·6	18	55	26	12	73	15
Nov.	737	59	8	10	44	25	20	68	12
Dec.	702	50	7	22	52	25	28	64	8
1940									
Jan.	705	55	7·8	11	40	20	0	75	25
Feb.	523	53	10	5·5	47	25	12	72	16
March	640	52	8	5·8	44	23	17	61	22
April	682	73	10·7	2·8	48	34	15	79	6
May	570	63	11	4·9	60	38	5	79	16
June	478	45	9·4	3·3	38	17	11	71	18
July	508	57	11	5·2	40	22	13·5	63·5	23
Aug.	546	48	9	8·3	37	18	11	67	22
Sept.	526	37	7	8	35	12	0	92	8
Oct.	618	49	8	4	40	19	16	68	16
Nov.	638	46	7·2	4	33	15	13	87	0
Dec.	600	54	9	7·5	33	24	12·5	75	12·5
1941									
Jan.	649	49	7·5	10	28	14	14	57	29
Feb.	550	44	8	7	29	13	0	77	23
Total	10,923	931	8·5	9·2*	42·5	387	13·3	71·4	15·3

* Excluding first five months, 5·8%.
† The organic group also contained 1 case of carcinoma and 9 of gastro-enterostomy in which there was no precise evidence of the site of the ulcer.

This paper is chiefly concerned with a statistical survey of the problem as it presented itself at one of the largest military hospitals in the country. The fifteenth patient admitted to the hospital was the first of a long series of dyspeptics; of the first 150 patients 21 complained of dyspepsia (14%). By the end of February, 1941—eighteen months after war started—a grand total of 10,923 other ranks had been admitted; of these, 931 (8·5%) were dyspeptics (table I).

Most of these cases were put through the same routine. All were examined carefully after a detailed history had been taken. Most of them had a bismuth meal and a fractional gastric analysis. In the early days it was the practice to order these examinations only if it was considered they were likely to reveal any abnormality. This meant that a considerable proportion (32·5%) were sent back to their units in September, 1939, without either of these examinations (table I). Routine bismuth meals and fractional gastric analyses were soon instituted for all dyspepsias except those of very recent origin (for example cases with only two or three weeks' vague history, or those whose symptoms seemed to be due to constipation only); thus during the whole of the last thirteen of the eighteen months under review only 5·8% of all dyspeptics were returned to their units after a purely clinical examination and treatment. This meant that the R.M.O. could be presented and the patient confronted with negative X-ray and pathological findings, and these seemed to mean much more to them than our carefully considered opinion based on purely clinical grounds.

TABLE II—PUBLISHED FINDINGS IN PATIENTS ADMITTED TO SERVICE HOSPITALS IN THE PRESENT WAR

Authors	Type of hospital	Total cases	Ulcers %	Number gastric	Number duodenal	% of ulcers duodenal
Allison and Thomas	Naval	100	45	6	34	85
Brockbank*	Military	931	42·5	52	275	84
Graham and Kerr	,,	246	64	23	135	85
Maingot	General	256	56	15	128	89
Morris	Military	500	50	..	..	..
Payne and Newman	E.M.S.	287	89	42	164	80
Spillane	Military	over 200	32	10	54	84
Willcox	E.M.S.	41	69	7	19	73

* Includes 1 case of carcinoma and 9 of gastro-enterostomy in which there was no precise evidence of the site of the ulcer.

For the purpose of this series of cases I am defining as proved cases of ulcer those who had positive X-ray findings fitting in with the clinical picture; those who had had a gastric operation with recurrence of symptoms; and those who had had hæmatemesis or had passed definite black tarry stools. The only case of carcinoma of the stomach that we saw is included in the general figures. The vast majority of these dyspepsias originated in civilian life. I have no figures with which to prove this, but we always took great interest in cases of proved ulcer that seemed to have originated during Army life; I doubt whether in the whole series there were more than a dozen—about 1% of all dyspeptics and 2% of all cases of proved ulcer.

It was thought at the beginning that all the dyspeptics would soon be weeded out of the Army and that therefore the numbers admitted would fall off considerably, but that did not prove to be so. The eighteen individual monthly figures show that the largest number of dyspeptics admitted was 73 in April, 1940, and the smallest 37 in September, 1940 (table I); the monthly average was 52. The average admissions for the first six months was 52, for the second six months 56, and for the last six months 47; the problem is, in fact, still present almost as badly as it ever was. Of these 931 cases of dyspepsia 397 (42·5%) were considered to be cases of peptic ulcer. This percentage fell off in the last four months. In the first six-month period it was 46%, in the second 44%, while in the third it had dropped to 33%. The number of cases of proved ulcer thus showed a definite decline. My average figure agrees well with that of Allison and Thomas (1941), who reviewed 100 cases of sailors and marines with dyspepsia and demonstrated a gastric or duodenal ulcer radiologically in 45%. Several other series of figures have been published (table II).

Spillane's (1941) figures covered twelve months and are described as cases of chronic dyspepsia. Morris's (1940) figures are based on 500 cases sent for X-ray examination and cover many of the cases in the present series. His percentage figure is bound to be higher than mine because his series does

not cover those cases with mild symptoms not considered worthy of X-ray examination. Maingot's (1941) series deals with 256 soldiers referred to a general hospital on account of dyspeptic symptoms. Those of Graham and Kerr (1941) were drawn from all branches, Navy, Army, Air Force and Women's Auxiliary Services, those from the Army preponderating. They cover a period of fourteen months in a military hospital. Willcox's (1940) material was 260 medical cases sent from France to sector hospitals in this country, and must be presumed to consist only of the more severe grades of dyspepsia, severe enough to merit being sent back from France. The same applies even more to the figures of Payne and Newman (1940), for their 287 patients already suggested a gastric or duodenal lesion before they were asked to see them; small wonder that their percentage of ulcers is so high.

DISPOSAL

In the early days of the war it was our habit to return to duty cases of proved ulcer in which the lesion did not appear to be particularly active. In September, 1939, 50% of the cases were returned to their units (table III). This proved to be a mistake, for the men became a nuisance. In October, 1939, only 29% were sent back to duty. Thereafter it was decided to board out of the Army all cases of proved ulcer with symptoms. For the remainder of the eighteen months only 7% of these cases were sent back to duty. These in the main consisted of men whose symptoms seemed to be trivial despite the X-ray diagnosis and of senior N.C.O.s who were anxious to remain in the Army and who were thought to be in a position to modify the Army food to their own particular needs. This was not in accordance with Army regulations, for even in peace-time it was held that peptic ulceration was incompatible with Army routine even when the man was billeting himself at home. But the problem of disposal was causing so much trouble that the Army authorities issued, in March, 1940, the following instruction to presidents of medical boards for their guidance in dealing with gastroduodenal cases:

a. Chronic cases with long-standing history consistent with gastroduodenal lesion together with evidence of physical manifestation (e.g., deficient nutrition, anæmia, abdominal tenderness) should be recommended to be transferred to a lower class than that in which they are at present serving.

b. (1) Cases exhibiting active gastroduodenal symptoms with proved organic lesions, and (2) cases with history of past operation for perforation or gastrectomy or a short circuit operation, and with recurrent symptoms of active ulceration or recent hæmorrhage with radiological evidence of active ulcer, should be recommended to be discharged as permanently unfit for military service.

These instructions rather suggested that a radiological lesion must be detected before a man could be discharged from the Army. Seven months later this impression was corrected by the circulation of an epitome of a report by the consulting physician to the Army ("Conferences with Medical Officers and Tours").

Peptic ulcer.—The War Office letter [quoted above] relates to certain recommendations for the guidance of presidents of medical boards in dealing with gastroduodenal cases. It may be argued that these recommendations preclude the invaliding of cases not proved radiologically to exhibit an active ulcer. Lowering of category in such cases is, however, useless as they will relapse in any category. Where a case is clinically one of peptic ulcer and the radiologist's report gives a diagnosis such as duodenitis and duodenal irritation, &c., in which the radiologist finds certain abnormalities in the duodenum, the case for the purpose of boarding should be regarded as one of duodenal ulcer.

Where cases are diagnosed on clinical grounds and the X-ray findings are negative presidents of medical boards are not excluded from accepting such cases as peptic ulcer. Each case should, however, be judged on its merits. Such cases must be given careful consideration and it would be unwise for him to be invalided out of the Service unless the board is reasonably satisfied with the evidence.

Dyspepsia and gastritis.—Cases of dyspepsia and gastritis which occur frequently in an intake shortly after joining should be retained with the unit, during their earlier period of training, in spite of repeatedly reporting sick. Simple remedies from the unit medical officer relieve the condition. Hospital treatment does not assist in inducting the required adaptation to the new environment in the Service and relapses consequently take place.

Finally, in February, 1941, another War Office letter was issued in which the situation was clearly explained.

Disposal of gastroduodenal cases.—A soldier whose case falls into any one of the groups mentioned below should be recommended for discharge from the Army as permanently unfit for military service.

1. Chronic cases with a well-authenticated long-standing history consistent with the presence of gastroduodenal lesion in which there is evidence of physical manifestation such as, for example, deficient nutrition, anæmia or abdominal tenderness.

2. Cases exhibiting active gastroduodenal symptoms with a proved organic lesion; or

3. Cases with a history of past operation for perforation.

During the whole period of 18 months, therefore, 90% of cases of proved ulcer were discharged from the Army, a total of 351 cases. The percentage is higher if the first two months are discounted, in which case 93% of proved ulcers were discharged (table III). Of the 397

TABLE III—DISPOSAL OF DYSPEPTICS

Month	WITHOUT PROVED ORGANIC LESIONS					WITH PROVED ORGANIC LESIONS				
	Cases*	Returned to duty		Category E		Cases‡	Returned to duty		Category E	
		No.	%	No.	%		No.	%	No.	%
1939										
Sept.	22	20	90	2	10	14	7	50	7	50
Oct.	23	21	91	2	9	28	8	29	20	71
Nov.	33	30	90	3	10	26	2	8	24	92
Dec.	24	23	96	1	4	26	1	4	25	96
1940										
Jan.	33	32	97	1	3	21	4	19	17	81
Feb.	28	23	82	5	18	25	3	12	22	88
March	29	27	93	2	7	23	1	4	22	96
April	38	35	90	3	10	35	3	9	32	91
May	25	24	96	1	4	38	2	5	36	95
June	28	25	89	3	11	17	1	6	16	94
July	34	30	88	4	12	23	2	9	21	91
Aug.	30	28	93	2	7	17	2	12	15	88
Sept.	24	22	92	2	8	13	0	0	13	100
Oct.	28	25	89	3	11	20	2	10	18	90
Nov.	31	30	97	1	3	15	1	7	14	93
Dec.	30	30	100	0	0	24	0	0	24	100
1941										
Jan.	35	32	91	3	9	13	0	0	13	100
Feb.	31	28	90	3	10	13	1	8	12	92
Total	526	485	*90*	41	*10*	391	40	*10*	351	*90*
Ex 2 m†	481	444	*92*	37	*8*	349	25	*7*	324	*93*

* Eight cases transferred to other hospitals are excluded.
† Excluding first two months.
‡ Six cases are excluded. Five of these were transferred to other hospitals, and one patient with carcinoma of the stomach died.

cases of proved ulcer 13·3% had gastric ulcers, 15·3% pyloric ulcers and 71·4% duodenal ulcers (table I). These figures agree remarkably with figures published elsewhere if the indeterminate pyloric ulcers are excluded (table II).

There remain to be considered the 534 cases in which no ulcer could be found. These comprise: cases of clinical ulceration not confirmed radiologically but usually confirmed by fractional gastric analysis; cases in which no ulcer appeared to exist (i.e., cases of hyperacidity, hypoacidity and nervous dyspepsia); and a few in which there did not appear to be anything wrong at all. Of this group of cases, throughout the full eighteen months, 90% were returned to duty, mostly without any lowering of category, and the remaining 10% were dicharged from the Army on purely clinical grounds (table III). It is to be regretted that a sudden transfer prevented the working out of statistics based on fractional gastric analyses. The men who were sent back to duty went with a somewhat disgruntled air but they very rarely returned to us; they seemed to realise that they had had a fair examination and were unlucky: there was nothing else to do, therefore, but get on with the war. Some of them had an increased acidity; if this was well-marked, the R.M.O. was advised to prescribe alkalis. If it was very high the man was put in category C. A considerable number had lowered or absent acidity; in most of these it was not considered that this was the cause of the symptoms. If, on the other hand, it

did appear to be the cause then the R.M.O. was advised if possible to give the man min. 20 of dilute hydrochloric acid well diluted in water before the principal meals of the day.

All this has meant that a large amount of hospital accommodation has been taken up. The cases sent back to duty remained in hospital on an average thirteen days (table IV). Those boarded out were in

TABLE IV—NUMBER OF DAYS IN HOSPITAL

Month	Cases returned to duty			Category E		
	Av.	Max.	Min.	Av.	Max.	Min.
	(days)			(days)		
1939 Sept.	13	41	4	30	35	18
Oct.	16	42	5	19	29	11
Nov.	16	41	8	15	23	9
Dec.	13	31	5	12	30	3
1940 Jan.	13	46	6	12	29	4
Feb.	16	38	4	14	46	4
March	14	36	5	13	42	3
April	12	25	7	10	19	3
May	10	18	6	12	33	6
June	9	17	4	19	29	10
July	12	28	3	24	37	12
Aug.	11	40	5	21	31	15
Sept.	12	33	4	23	44	12
Oct.	13	28	8	21	62	11
Nov.	15	32	8	22	37	12
Dec.	16	39	7	26	50	7
1941 Jan.	15	39	6	22	30	9
Feb.	13	27	8	18	27	7

hospital a variable period depending on the Army's current method of procedure for these cases as well as on our own slickness. In September, 1939, each category E patient was in thirty days on an average. In successive months, however, this figure fell until in April, 1940, they were actually discharged from hospital ten days after admission. The authorities then tightened up the procedure and the figure at once rose into the twenties, where it remained for nine months with one exception.

MALINGERING

True malingering was rare. But there was a type of case that complained of vomiting after every meal and yet contrived to look uncommonly fit on it. This vomiting was done without eye-witnesses and appeared to cease directly the man was forced to vomit in public. These patients probably exaggerated their symptoms. Most of them had been to hospital once or twice, their story being more spectacular on each occasion.

It is to be regretted that some M.O.s fail to check up on a patient's symptoms before sending him to hospital. I once admitted a case labelled threadworms. We failed to find any clinical or microscopic evidence of these, but careful questioning elicited the information that the man knew he had worms because he could feel them biting his seat. He was sent back to his unit and returned to us two days later with the diagnosis: "Threadworms still present." To my great joy he told me he hadn't had his bowels opened since he had left us and that the M.O. hadn't examined him at all. So I rang up the M.O. and found, as I thought, that he had never seen any threadworms himself, and hadn't even looked for any; he had accepted the man's story without question. He admitted that if he had known the man felt them biting him he wouldn't have sent him to me, though he might have troubled the psychiatrist. I sent the man back with the promise that if any ocular evidence of worms could be produced I would readmit him with pleasure, but he never came back.

DURATION OF SERVICE AND ITS EFFECT

I have unfortunately no accurate figures of my own to show how long the men with peptic ulcers had been on Army service. I am, however, indebted to Colonel W. W. Browne, president of the Western Command standing medical board, for the following figures, based on his own records:

Of all the men discharged from the Army through his board during a certain period, 14·2% were suffering from gastric or duodenal ulcer; in addition 3% were discharged for chronic gastritis.

All the cases were radiologically positive except for a small proportion discharged on account of either recurrence of symptoms after operation or an enlarged duodenal cap with the addition of the typical duodenal type of hyperacidity. Periods served were as follows:

	%
Less than 1 month	1·6
1–3 months	14
4–6 months	12·4
7–12 months	26
More than 12 months	46

Most of these cases gave a history of many years' standing. Many of them were actually on a strict diet (milk, eggs and fish) up to the time they were called up. They found that they were unable to digest the meat, and in particular the stews. They also complained of the excess of greasy foods, though this complaint is heard much less now than it was in the early months of the war. In a large proportion it was possible to obtain a history that during the early months of the war the man had managed to buy enough food outside to keep going without eating the army meat. Sometimes a man was lucky enough to be in good lodgings where he was able to diet and sometimes he was even luckier in that he was able to live at home. Then suddenly he was moved, and since the same facilities were no longer available the symptoms returned and he had to report sick.

DISCUSSION

It is not unnatural that the civilian medical boards have come in for some degree of criticism for passing so many dyspeptics into the Army. Their instructions for the guidance of medical boards under the Military Training Act, 1939, are clear.

Gastric and duodenal ulcer: If a man gives a history or brings a certificate suggesting the existence of an ulcer of the stomach or duodenum and has undoubtedly had hæmatemesis or melæna within a recent period of time, the presence of an ulcer may be assumed and he should be placed in grade IV, or deferred for 6 months. Cases of recent operation such as gastro-enterostomy should be deferred for 6 months and then reconsidered. On the other hand the mere complaint of indigestion with abdominal pain, even if extending over some years, is not a bar to placing the man in the grade for which he is otherwise suitable, and many men with these symptoms may be placed in grade I or II.

In fairness to these civilian medical boards there is another side to the matter. Critics have thought that they should be more strict about passing gastro-intestinal cases into the Army; the psychiatrists say the same about psychiatric cases; the ophthalmologists say the same about eyes; the cardiologists and neurologists and orthopædic surgeons all say the same about their bit of the human body. In fact if the members of these boards listened to all the specialists, both civilian and military, our Army would not have enough men to fight on as many fronts as we are doing. Let it be freely admitted that these boards have done their job very well indeed and that it is wrong to criticise them in the way they are apt to be criticised. Where there is a doubt about a man's fitness for service the R.A.M.C. provides the best means of making an accurate decision and that means that the civilian boards must pass the man through in the first instance so that the Army can make the decision.

There seem to be two morals in all this. First, it is vitally necessary to find out the cause of the great increase in ulceration of the stomach and duodenum, but that hardly comes within the province of the Army physician. Secondly, all cases of possible peptic ulceration need to be carefully examined and classified clinically, radiologically and often pathologically by skilled medical men; and in cases of doubt the Army authorities are the best for the job. Fractional gastric analysis is particularly useful; examination for occult blood is not so useful.

There is no increase in the incidence of peptic ulceration as a result of the war. What the present war has revealed is that peptic ulcer and gastritis were unexpectedly common in the civilian population before the war began, and the fact, not altogether surprising, that organic dyspepsia is incompatible with Army life.

SUMMARY

A series of 931 consecutive cases of dyspepsia admitted to a military hospital during the first eighteen months of

the war are analysed. They represented 8·5% of all admissions. The monthly average throughout the period was 52 and was more or less constant.

Of these, 397 (42·5%) were considered to be cases of peptic ulcer. This percentage fell in the successive six-monthly periods, being 46%, 44% and 33%. After the first two months of the war only 7% of these cases were sent back to duty; the rest were discharged from the Army.

Of the total ulcer cases 13·3% had gastric, 15·3% pyloric and 71·4% duodenal ulcers; most of these gave a history of many years' duration.

A group of 534 (57·5% of the total dyspeptics) were considered to have no peptic ulceration; 90% of these were returned to duty, mostly without any lowering of category, the rest being discharged from the Army.

Every case of dyspepsia of more than a month's standing should be examined clinically and radiologically. If possible a fractional gastric analysis should be carried out.

Of all men discharged from the Army through a particular command medical board during a particular period, 14·2% were suffering from peptic ulcer; 54% of these were discharged after less than 12 months' service.

There is no evidence of an increase in peptic ulceration as a result of the war, but the war has revealed the unsuspected commonness of peptic ulcer and gastritis in the civilian population before the war began. It is vitally necessary that the cause of the great increase in peptic ulceration since the last war should be determined.

I wish to thank Major Hugh Morris, Major W. F. Mair, and Major R. W. Fairbrother for their help.

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DISTURBANCES OF THE BODY SCHEME

ANOSOGNOSIA AND FINGER AGNOSIA

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THE term "body scheme" was introduced by Head and Holmes (1911) to signify the concept which a person develops of his own body. The body "scheme," "image" or "pattern" means the picture of the body which is formed in the mind. It became evident to these observers while studying the sensory activity of the human cortex that "one of the faculties which we owe to cortical activity is the power of relating one sensation to another, whether they arise simultaneously or consecutively." The sensory cortex becomes a storehouse of sensory experience; it receives impressions, stores them and judges new ones in the light of its experience. A standard is formed against which incoming impressions are modified and subsequent conduct determined. In the formation and maintenance of this plastic body image the importance of optical and postural impressions is therefore to be expected. An obvious corollary is that distortion of our own postural model may be associated with loss of orientation in regard to the bodies of other people. Finally, lesions of the sensory cortex may be expected to result occasionally in disorders of the body scheme.

ANOSOGNOSIA

The term "anosognosia" was first used by Babinski (1914) and means unawareness of disease. He reported the cases of 2 hemiplegics who were unaware of their paralyses. Unawareness of blindness had been described by C. von Monakow (1885) in a patient with bilateral disease of the occipital lobes, and unawareness of deafness by Anton (1899); the latter also described lack of recognition of hemiplegia following Pick's original observation in 1898. It has been pointed out (Nielson 1938) that anosognosia is a general term, applied to disease as a whole, but that Babinski used it in a specific sense. By anosognosia Babinski meant unawareness of hemiplegia and as such the term has remained. Cases have since been reported, however, in which, as Meige suggested in the discussion following Babinski's paper, the limbs and not the paralyses have passed out of consciousness. In its mildest form the disorder may merely be a periodic "forgetting" of a limb (Alajouanine et al. 1934, von Stockert 1934, Ives and Nielsen 1936), a delusion that can be corrected by persuasion and argument. In such cases the limb disappears from the attention rather than from consciousness. In other cases one whole side of the body may disappear from consciousness (Barkman 1925)—a *negative* condition (Koch and von Stockert 1935) to be distinguished from a *positive* feeling or delusion of absence of the side, such as was observed in 2 cases by Ives and Nielsen (1937). In most reported cases a period of disturbance of consciousness preceded the development of the anosognosia, but there are exceptions (Babinski 1918, and von Hagen and Ives 1937).

Where there existed true imperception of hemiplegia the paralysis was always on the left side, together with homonymous hemianopia. In the only 4 cases in which autopsy reports are available a lesion of the right optic thalamus was observed. Pick's case had chronic diffuse meningitis with softening in the right thalamus and first and second right temporal convolutions. Pötzl's (1924) second case revealed superficial softenings in the right parietal and occipital lobes with a large area of vascular necrosis in the right thalamus. In his first case there were left hemianæsthesia and in the second homonymous hemianopia. The case described by von Hagen and Ives showed left homonymous hemianopia, left hemiplegia and hemianæsthesia, unawareness of hemiplegia. At autopsy there were several metastatic cerebral abscesses, one involving the right thalamus, caudate nucleus, globus pallidus, internal capsule and adjacent structures. Thus, in genuine anosognosia (imperception of hemiplegia) the constant finding of a lesion in the right optic thalamus suggests that the trouble lies in the failure of sensory impulses from the paralysed side to reach consciousness.

In the second type of case—that in which there need be no hemiplegia and no unawareness of disease but in which there is periodic "forgetting" or absence from consciousness of a limb or of one side of the body—the lesion does not so constantly affect the thalamus. It is usually more superficially situated in the parietal cortex so that the disturbance is not merely one of non-perception of impulses. There is then a true distortion of the body scheme resulting from a lesion at a higher level. In the first of the 2 cases reported by Ives and Nielsen (1937) the causative lesion was an area of vascular softening in the *right* retrolenticular portion of the internal capsule partly involving the thalamus. The patient was aware of his paralysis (left hemiplegia) but denied that the paralysed limbs belonged to him; he thought they belonged to the doctor. In their second case the patient similarly refused to acknowledge that his paretic left arm was really his own: "Someone is substituting this arm for my left arm," he repeatedly stated. At autopsy there was diffuse vascular softening of the right cerebral hemisphere. It involved the lenticular nucleus but not the thalamus.

CASE 1

An officer-cadet was admitted to a military hospital in May, 1940, complaining of severe occipital headache of sudden onset a few hours previously. Temperature 99° F., pulse-rate 90 per min. He showed neck rigidity, spinal tenderness, brisk knee- and ankle-jerks and a positive Kernig sign; plantar responses were normal. Lumbar puncture produced a sterile blood-stained fluid. He remained fairly well for a week and further puncture indicated that there had been no fresh bleeding. Then signs of severe meningeal irritation developed, with bilateral extensor responses, extreme spinal rigidity and much headache. It was found necessary to tap him daily, for papilloedema rapidly developed with retinal hæmorrhages, recurrent coma and general deterioration. He lost flesh alarmingly and was gravely ill for several months. Unconscious periods occurred frequently and on a few occasions he ceased breathing. Artificial respiration was repeatedly employed and frequent lumbar puncture released deeply stained fluid under high pressure (360 mm.) of water. There was every indication of a constant seeping of blood from an intracranial aneurysm over a period of two months. Root

pains were excruciating at times and large doses of morphia became necessary. After three months the cerebrospinal fluid began slowly to clear. He was then poorly orientated except for short lucid intervals and both optic discs were choked and his legs spastic.

Then, one morning, he told me that there was no room for "him"—some other person—between his own body and the wall. It soon became evident that he thought this other person was "somebody in bed—over here" (pointing to his left side). Asked how long this "he" had been there he replied, "all the time—he moves about." This delusion persisted all day, but that evening he became violent and tried to get out of bed. He slumped to the floor unconscious. The following morning it was noticed that he had a left-sided hemiplegia and there was a recurrence of subarachnoid bleeding. There was only slight left facial weakness, but little movement was possible in his left arm or left leg. Biceps, triceps and supinator jerks were present but very sluggish; there was no grasp reflex; abdominal reflexes were absent on both sides; knee- and ankle-jerks on the left side were feebly present; tendon jerks on the right side were hyperactive; there was a positive extensor response on the left side and a doubtful positive response on the right. His head and eyes were turned to the right and he talked volubly. He had now little pain and was euphoric. There was general diminution of response to touch and pin-prick over the left side of the body, more definite in the left arm. Responses were variable and often incorrectly interpreted. Pin-prick was more affected than touch. Position sense was much reduced in the left arm, while in the leg it was poor. He did not realise that he could not move his left arm and leg. He frequently indicated with his right arm that he thought he had been touched on the right thigh whereas he had been touched on the left thigh. When asked to move his right arm and leg he did so correctly, but when asked to move his left limbs he moved his right. Asked how his left arm and leg felt he replied, "Fine." When I told him that he could not move his left arm and leg he smiled and said, "That arm is all right." When his left arm was held up in front of him he said, "That was the one—he presses on me—these beds are small."

During the next few days his general condition remained unchanged but his memory deteriorated, especially for very recent events, and he chatted continuously. He persisted in asserting that his arms and legs were not weakened and on several occasions he was forcibly restrained from getting out of bed. As far as one could judge there was no hemianopia. Five days after the onset of the hemiplegia, when there was slight return of power, he was persuaded after much argument that the paretic limbs held up for him to see were actually his own. But when they were covered up again, and he was requested to move them, he merely moved his right limbs.

In the next five months no further bleeding occurred and power was eventually much restored in his limbs. Postural sense was the first to be restored and the allœsthesia and polyæsthesia disappeared completely. With return of muscular power came a return of normal orientation about the left limbs. About six weeks after the onset of the hemiplegia he was able to raise his left arm and leg on request. Eight months after the onset of his illness he walked out of the hospital unaided. When last heard of, two months later, he had continued to improve.

It was conjectured that the bleeding had come from a congenital intracranial aneurysm, possibly placed on the right middle cerebral artery, which had ruptured into the subarachnoid space and later into the substance of the right parietal lobe

FINGER AGNOSIA AND CONFUSION OF RIGHT AND LEFT

In 1924 Gerstmann described a condition of finger agnosia, confusion of right and left, acalculia and agraphia, due to a lesion in the left parieto-occipital area of the brain. There was difficulty in recognising, naming, selecting, differentiating and indicating the fingers of either hand, the patient's own as well as those of others. To this condition he gave the name "finger agnosia." The disorientation for right and left applied to the patient's own body and to that of others. Acalculia (difficulty in calculating) and agraphia (difficulty in writing) were less constant. General confirmation has since been obtained (Herrmann and Pötzl 1926, Lange 1930, Marburg 1931, von Stockert 1934, Muncie 1935, Mayer-Gross 1935, and Nielsen 1938). The finger agnosia is usually more noticeable in relation to the three middle fingers; the thumb and index fingers are less often and less severely affected. The toes are not implicated. In contrast to the person with anosognosia this type of patient is mentally coöperative, alert and has no motor or sensory paralysis. Visual, tactile and postural comprehension are unaffected, but the patient may be poorly orientated for time. Unconsciousness does not occur during the period of observation of the symptoms. Although the finger agnosia may exist by itself it is usually accompanied by difficulty in right and left orientation. Actions dependent on correct self-lateralisation are thus performed with difficulty. The agraphia is more apparent in attempts at spontaneous writing than in copying and is not a constant feature. The acalculia is demonstrated by frequent errors in simple arithmetical calculations. The position and sequence of the digits within a figure are not appreciated.

In Gerstmann's (1924) first case no autopsy was available but he postulated a vascular lesion in the region of the left angular gyrus. This was substantiated by the finding by Herrmann and Pötzl (1926), in a similar case, of a neoplasm in that area. There have since been similar autopsy confirmations and it has been shown that the syndrome may appear at any time during the course of an illness produced by a lesion, vascular or neoplastic, in the parieto-occipital region. Perhaps the most striking feature of the syndrome is that, with one exception, the lesion has always been situated in the left cerebral hemisphere. In one of Herrmann and Pötzl's cases the lesion was found to be in the corresponding area of the right hemisphere. This patient, however, was ambidextrous.

CASE 2

A recruit, aged 25, was admitted to a military hospital for observation, at the request of his unit medical officer. His drill instructor had observed that he could not differentiate between right and left. He was a tall, heavily-built youth with a pituitary type of obesity, weighing 15 st. He was the only child of his father's first marriage. His maternal grandfather had some sort of speech difficulty and could not write. His mother and three of her sisters had suffered from Graves's disease. He developed slowly and did not begin to walk until his third year. At the age of 5 years he was still unable to talk properly and he did not begin school till he was 8. It was soon realised that he found reading difficult and that his sense of left and right was poorly developed, so he was sent to a special school and received private tuition until he was nearly 20. At the age of 12 he was examined by Sir James Purves-Stewart and a line of treatment and education arranged. He improved sufficiently to be employed by his father in a small factory as a sort of general overseer. He remained at this work until he was called up in 1940.

Confusion of right and left.—The most striking defect was his failure to orientate himself for right and left. When asked to show his right or left hand, he did so hesitatingly, and after much thought. But if requested to take two steps to the left and to turn right he was at a complete loss and would execute clumsy and confused movements. A request to touch his right ear or eye with his left hand led to further difficulty, but in most instances he was able eventually to carry it out. Mistakes were frequent when similar tests were applied to his heels and knees. Not only was he slow to execute commands involving correct lateralisation about his own body but also about that of others. Mirror tests showed similar difficulties.

Finger agnosia.—He could not identify all his fingers. Mistakes were made not only in laterality; he could not distinguish his ring from his middle finger and often failed to distinguish his index from either. The defect involved recognition and selection as well as naming. Asked to show his "right fifth," "left fifth," "left first" fingers he responded correctly. But asked to hold up his "left second," "right third," "right third," "left fourth" and "left first" fingers, he selected his left fourth, right second, left third, right third and right fifth fingers. When asked to name the fingers I touched he gave only 4 correct answers out of fifteen tests. The same tests repeated before a mirror, or with his hands crossed, gave even poorer results. When the tests were applied to my own fingers he was wrong 12 times out of 20. All tests were carried out with the aid of vision and there was no apraxia or astereognosis. Identification of the toes was normal, except for occasional mistakes in laterality.

Alexia and agraphia.—He understood what was said to him and carried out oral and—after much effort—written commands. Speech was normal, although rather slow and monotonous. He could not readily recall certain words. There

was no difficulty in recognising or naming objects. He could write from copy but only very slowly to dictation and with many spelling mistakes. Words were often spelled phonetically and mistakes were not recognised. He could tell the time, set the hands of a clock correctly and match and identify colours. When asked to read he spelled out each word slowly, tried to pronounce it, and then, if it sounded familiar to him, would proceed to the next word. It was apparent that he had difficulty in identifying letters and that only by appealing to his auditory memory could he read. Letters such as b, p, q, r, d, g, h, m, n, v and w were repeatedly confused.

Acalculia was to be expected in view of his lack of training and of his difficulty in identifying letters and numbers. He could not distinguish the multiplication sign from the sign of addition, and division sign was meaningless. The subtraction sign was recognised and understood, but nevertheless he could not subtract correctly in many instances. Apart from the difficulty in deciphering symbols he made many mistakes in simple arithmetic.

DISCUSSION

In the two disorders of the body scheme described the symptoms and signs seem to depend not only on the location of the lesion within the brain but also on the side of the brain affected. In the case of a lesion in the right thalamoparietal region, there may be unawareness of left hemiplegia, periodic forgetting of the left arm or leg, or a disappearance of the left side of the body from consciousness. The patient may deny that his left arm or leg belongs to him. Disturbances of sensibility of a cortical type are usually present in the affected limbs and hallucinations of sensation, with transference (alloæsthesia) to the normal side, may appear. In the second type of case a lesion in the left parieto-occipital area leads to disturbance on both sides of the body. Confusion between right and left and finger agnosia appear, while there may sometimes be agraphia and acalculia. Hughlings Jackson (1889), writing on the nature of the duality of the brain, thought that there were greater mental defects, of a sensory kind, in left hemiplegia and that the lesion responsible was in the thalamus. Head (1920, 1926) found that, in all forms of aphasia and amnesia, tests involving the appreciation of right and left were always poorly performed. Tests for right and left in the mirror, however, were usually well done, except in those groups he described as having a semantic defect. The lesion in such cases lay in the neighbourhood of the left supramarginal gyrus (parieto-occipital area). Schilder (1935) suggested that imperception on the left side of the body occurs more frequently than on the right because it is really an exaggeration of a normal tendency. "A focal lesion added to this tendency . . . will provoke the picture of imperception of the left side."

Why the fingers should be more susceptible to disorder in the body scheme is not understood. The coincidence of finger agnosia, acalculia and agraphia may result from proximity of cerebral localisation or because there is some deep similarity between them, but both factors may be involved. In the mind of the child, figures and fingers are closely associated and knowledge of the fingers develops rather slowly. Orton's (1934) studies on congenital word-blindness and strephosymbolia have shown that the question of right and left is involved. Such patients are unable to distinguish between reading from left to right and from right to left. They confuse p and q, b and d, and so on and cannot separate "dog" from "god." Orton referred to "hemispheric rivalry" as the major factor.

The phenomenon of the phantom limb is a well-known example of disorder of the body scheme. The phantom is often painful and on this ground alone thalamic activity may be suspected. The phenomenon may arise as a result not only of amputation but also of interference with its nerve-supply either peripherally or within the spinal cord (Mayer-Gross 1929). Schilder has recorded a case in which, after amputation of the two distal phalanges of the 3rd and 4th fingers of the left hand there were two distinct phenomena: first the presence of the phantom phalanges, and secondly the forgetting of the defect. Head (1920) described how a phantom limb disappeared from consciousness following a stroke. The lesion which reduced postural impressions also destroyed the phantom. One of Betlheim's (1926) patients thought that his phantom limb was being preserved somewhere for him and would be restored to him eventually. Such observations bring the phenomenon of the phantom limb closer to that of imperception of hemiplegia and of the left limbs.

SUMMARY AND CONCLUSIONS

Two cases are described which illustrate disturbances of the body scheme. In the first, there was unawareness of left hemiplegia with alloæsthesia, hypoæsthesia, delusions about the left side of the body and Korsakow's psychosis. These symptoms arose in a patient with chronic bleeding from a congenital intracranial aneurysm. It was surmised that the aneurysm, which may have been situated on the right middle cerebral artery, had ruptured into the right parieto-thalamic region. In the second case there was a congenital defect consisting of confusion between right and left, alexia, finger agnosia, agraphia and possibly acalculia. The defects probably arose as a result of agenesis in the left parieto-occipital region.

It is apparent that the human mind is accustomed to function in a complete body. As a result of lesions at different levels of the nervous system the image of the body as it appears to the mind may be distorted or partially destroyed. The right cerebral hemisphere is "inferior" to the left in that when diseased it does not lead to disorientation for right and left, and affects only the opposite side in the body scheme.

The fact that a localised lesion of the brain can alter the mind's image of the human body presents us with an unusual opportunity for observations on the relationship between mind and body. War-time injuries of the brain should provide suitable material for such a study.

I wish to thank the Director-General of the Army Medical Services for permission to publish this paper.

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AGNOSIA OF HEMIPLEGIA AND OF BLINDNESS AFTER CEREBRAL EMBOLISM

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A WELL-BUILT man, aged 52, came under my observation in November, 1939, with signs of subacute or chronic bacterial endocarditis (endocarditis lenta), which was probably already of about a year's duration. On March 16, 1939, he had had a severe cerebral stroke with coma and right hemiplegia lasting a few days, but with aphasia, alexia and agraphia of much longer duration. In fact in November, though the hemiplegia had cleared up, he still had a trace of aphasia and was diligently learning to read and write again. On Aug. 1, 1940, he had another and severer attack of coma, this time with left hemiplegia—evidently due to right-sided cerebral

embolism, just as the previous attack had been due to left-sided cerebral embolism. In the course of many days he slowly recovered from the coma, but the paralysis of the left limbs persisted, together with the complete blindness, of cortical type, which accompanied it. He could not get about and lay in bed with his eyes and head directed to the right and was unaware of his blindness and of his hemiplegia, both of which he denied. However, after this last terrible stroke there was no sign of active bacterial endocarditis, though of course the loud mitral systolic murmur persisted. The last positive blood-culture for a *Streptococcus viridans* was on April 12, 1940. I have already described the case, as far as the bacterial endocarditis was concerned (Weber 1941). I shall deal here only with the neurological aspect of the case.

From February to April, 1941, he remained helpless, lying in bed with conjugate deviation of the eyes and head to the right—that is, towards the side of the more recent and more extensive cerebral damage. Complete spastic paralysis of the left upper and lower extremities. Very slight left facial paresis of cerebral type. Pupils large and equal, reacting slightly to light. He was completely blind in both eyes, though repeated ophthalmoscopic examinations (Dr. Charles Markus) showed no changes in the fundi. Patellar and achilles reflexes active, more so on the left. Plantar reflex of normal flexor type on the right; doubtful on the left. Superficial abdominal reflexes not obtained.

Sensation, perception and intelligence.—He had complete anæsthesia of his left (paralysed) limbs, excepting that a tactile or painful stimulus to these limbs appeared sometimes to be referred to the trunk or to the right limbs (allæsthesia). On other parts of his body he could not always distinguish the position of a tactile stimulus (allachæsthesia); for instance, he confused stimuli on his ear, nose and hairy scalp. With his right hand (the left one was, as stated, quite anæsthetic) he could not in the least distinguish one object from another when holding and feeling it (bunch of keys, watch, coin, book, bottle), but he could detect a gross difference in weight. The astereognosia of objects held in his hand made one think of the want of recognition in cases of mind-blindness and mind-deafness. On one occasion he said that the sound of a watch was "like the sound of running water," but on another occasion he recognised the ticking of a watch when held to either ear. He could recognise the sound of metal being struck close to him. He could not always distinguish between the voices of those he knew. Nor could he always recognise the direction from which sounds came—there was often confusion of laterality. In regard to taste and smell he could distinguish eau-de-Cologne when it was held to his nose, and a drop of cognac when placed on his tongue. Apparently he could distinguish fairly well the taste of ordinary foods and sweets, especially of chocolate, of which he was fond.

He was unaware of (did not perceive) his blindness and his hemiplegia, and denied them both (anosognosia, Anton-Redlich-Bonvicini syndrome). When asked to give his left hand he invariably gave his right hand. When I placed his right hand against his left (paralysed and anæsthetic) hand he did not recognise that it was his left hand till he was told; the left hand felt to him like any object which, owing to his astereognosia, he was unable to distinguish. Moreover, he often made mistakes between right and left, both in speech, when saying from which direction he thought a sound is coming, and in pointing with his right (unparalysed) hand. When asked how many fingers and toes he had he seemed to be calculating mentally and answered that he had 10 toes, but stopped at 9 fingers. Yet in regard to simple small arithmetical calculations there was no acalculia—he answered quickly that multiplying 8 by 3 makes 24, and similar reckonings were easy to him. In his business he had been good at figures and also at distinguishing colour-shades; but an eye-specialist, consulted after the first attack of cerebral embolism, said that perception of colour had been lost. As to his remembrance of colour he could not revisualise correctly; he told me that his hair was light and that he had blue eyes, whereas in reality his hair was dark and he had brown eyes. On the other hand, he said he preferred blue clothes which, according to his wife, he actually used to like. In regard to his memory generally, he was right (according to his wife) when he told me there were 5 rooms in his last home before coming to England. Apparently he could not always find the word he wanted but in conversation he could answer questions more readily than ask them, excepting, of course, when he asked for food or other necessaries. He talked preferably in German, his native language, but probably understood as much English as he had ever known. On one occasion he dictated sensible letters to his two children in America, but his condition varied. Sometimes there was disorientation in time and place. He had periods of restlessness and bodily pains, when he made a good deal of noise and sedatives were necessary; at such times especially there was sometimes incontinence. His appetite was as a rule remarkably good, almost a bulimia, as if his sense of satiety had been lost. The recurrent periods of pain—especially in the lower trunk and thighs, more on the left (hemiplegic) side—were I suspect connected with his cerebral damage, and so, probably, were the periods of great restlessness. He died on April 28 during one of his periods of restlessness, at a home to which he had been removed on Feb. 28. Towards the end he lost much weight in spite of continued good appetite.

There was no autopsy, but his cerebral symptoms must have been due to large destructive lesions on both sides of the brain caused by embolisms from his endocarditis lenta. That in the left (dominant) hemisphere probably included part of the optic thalamus and the radiating connexion with the occipital cortex; that in the right (minor) hemisphere probably involved the optic thalamus and included the radiations to the occipital and part of the parietal lobe cortex. The lesion in the minor hemisphere doubtless gave rise to the remarkable Anton-Redlich-Bonvicini syndrome—the imperception or agnosia of his blindness and left hemiplegia. The cerebral stroke of March, 1939, was probably due to embolism of the posterior cerebral artery of the left (dominant) hemisphere, while in the attack of August, 1940, there was doubtless embolic obstruction in the right posterior cerebral artery, but the resulting cerebral necrosis seems to have been more extensive.

DISCUSSION

Imperception or agnosia of the signs of grave organic cerebral disease—hemiplegia or cerebral cortical blindness or deafness—has not often been described in England. Anton (1889) was the pioneer observer of this class of case. He reported 3 cases of imperception of blindness or deafness of cerebral cortical type. His views were criticised by Redlich and Bonvicini (1908 and 1911), who described cases of their own. Babinski (1923) introduced the term "anosognosia." Barkman (1925) summed up the literature and noted that up to 1925 in every case of agnosia of hemiplegia the hemiplegia had been on the left side—that is to say, it was produced by a lesion of the right (presumably minor) cerebral hemisphere—but Schilder (1935) narrated the case of a woman, aged 48, with severe right hemiplegia and imperception of it. In that patient the dominant hemisphere was presumably the right one and the left was the minor one.

Among striking cases in which the neurological symptoms more or less resembled those in my present case are some recorded by Kramer (1915), Pötzl (1924), Von Hagen and Ives (1939); and Nielsen and Sult (1939), in whose fifth case the neurological picture was in many respects identical with that of my present case.

Their patient, a man aged 52, had developed left hemiplegia suddenly 5 years previously, and complete blindness had followed a cerebral stroke on the day before admission. On feeling his left hand with his right he had the illusion that the left belonged to someone else. He had agnosia of his left side unless his attention was specially called to it. Asked to place his right hand on his left ear he placed it on the right one. Asked to place his left hand anywhere he used his right one. Asked how many ears, eyes, feet or hands he had, he always said "one." Asked how many fingers or toes he had he counted to ten and then answered "twelve." He consistently denied his blindness and claimed that he could see everything. In broad daylight he thought it was night. He could not revisualise correctly. He could not recognise objects when placed in his hands. He was always hungry (like my patient). Touch or pin-prick was more often referred to the other side than to the correct one. He was a Mexican and could converse intelligently in Spanish; what he had known of English was still familiar to him. There was no autopsy, but a diagnosis of thrombosis of both posterior cerebral arteries was made.

Von Hagen and Ives (1937 and 1939), who have obtained autopsies in some cases of agnosia of left hemiplegia, say that Barkman (1925) thought that involvement of the right optic thalamus was necessary for the production of the anosognosia, but from their own observations they conclude that anosognosia is

evidence of a lesion involving the thalamus in the minor hemisphere or situated in the immediate vicinity so as to separate the thalamus from the cortex of the frontal, parietal and temporal lobes.

In most typical cases there is also left homonymous hemianopia and tendency to conjugate deviation of the eyes and head to the right; there is also more or less sensory impairment on the left (paralysed) side. Schilder (1935), Nielsen and Sult (1939) and others discuss the occasional association of allochiria (allæsthesia) and allachæsthesia in such cases. Schilder in discussing a case recorded by Kramer remarks that it is at least probable that the same mechanism which prevents the patient from appreciating his hemiplegia and the left side of his body is also responsible for the transfer of the sensation from one side of the body to the other.

It is noteworthy that a cerebral agnosia-lesion may cause not only some kind of imperception in an actual limb but also in a phantom limb. Thus, Schilder quotes from Head:

"One of our patients had lost his left leg some time before the appearance of the cerebral lesion which destroyed the power of recognising posture. After the amputation, as in so many similar cases, he experienced movements in a phantom foot and leg. But these ceased immediately on the occurrence of the cerebral lesion; the stroke which abolished all recognition of posture destroyed at the same time the phantom limb."

It seems probable that my patient's complete blindness of cerebral cortical type was due to double homonymous hemianopia, as suggested to me by Dr. Russell Brain. The attack of left cerebral embolism in March, 1939, probably caused right homonymous hemianopia, which was not detected till the right cerebral embolism of August, 1940, produced left homonymous hemianopia and thus complete blindness. I think that in the fifth case of Nielsen and Sult (1939), to which I have already referred, a similar explanation must hold good for the complete blindness which followed the second cerebral stroke; but in their case the left hemiplegia accompanied the first stroke (not the second as it did in my case).

Absolute imperception of visual stimuli (complete cortical blindness) as a result of bilateral damage to the occipital lobes is rare. In the remarkable case described by Byrom Bramwell and his colleagues (1915) there was retention of macular as distinct from panoramic vision.

A man died of pneumonia at the age of 71 years, 26½ years after an attack diagnosed as acute nephritis, during which he suddenly lost his eyesight and had a series of epileptiform fits. He was unconscious for 14 days, and it was 3 weeks before he could recognise voices. When he regained consciousness he was quite blind, but afterwards his central vision was gradually in some degree restored. The fundi of the eyes appeared normal; there was neither mind-blindness nor word-blindness. During the remaining 26½ years of his life there were no fresh head symptoms and practically no change in vision, no motor paralysis, no loss of sensation, no sensory or motor aphasia. A large lesion was found in each occipital lobe at the autopsy. In regard to the retention of macular vision Carmichael's case (1930) may also be noted.

This was a boy aged 14, in whom Geoffrey Jefferson had performed a right occipital lobectomy. After recovery from the operation the patient had left homonymous hemianopia with sparing of the macular region. Four months later there was an attack of meningitis and the macular region was found also involved, the hemianopic boundary line "splitting the macula" (passing through the centre of the macular region).

Some of the pains often complained of by my patient were doubtless connected with his cerebral damage and so probably were his periods of restlessness. Discussions on the thalamic syndrome have thrown much light on this subject.

SUMMARY

In a man of 52 bilateral cerebral embolisms occurred as a result of endocarditis lenta and gave rise to permanent left hemiplegia and complete blindness of cerebral cortical type. The patient was unaware, and refused to admit the existence, of his blindness as well as of his left hemiplegia—the Anton-Redlich-Bonvicini syndrome.

I wish to thank Dr. W. Russell Brain, Dr. Charles Markus, Dr. H. K. Lauber, Dr. K. Blum, and Dr. Harry Shaw.

Continued at foot of next column

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Reviews of Books

Cancer of the Face and Mouth

Diagnosis, Treatment, Surgical Repair. VILRAY P. BLAIR, M.D.; SHERWOOD MOORE, M.D.; LOUIS T. BYARS, M.D. London: Henry Kimpton. Pp. 599. 50*s*.

IT is artificial, but clinically convenient, to group together in a book those forms of squamous-celled carcinoma occurring above the clavicle, with the exception of carcinoma of the larynx. This volume, written by three distinguished American authors, gives details of the treatment and results in a great variety of malignant conditions—including carcinoma of the face, ear, nose, orbit, lip, tongue, salivary glands, floor of the mouth, pharynx, cheek, alveolar process, palate and velum, nasopharynx and antrum—and in moles, nævi, melanomas, dentigerous cysts and adamantinomas, as well as secondary disease in the lymphatic glands of the neck. The book is not overloaded with figures, but there is a statistical chapter at the end of the text written by Dr. E. L. Keyes and based on 780 private cases treated by the late Ellis Fischel; it includes only five-year follow-up figures for microscopically proved disease, so that the material is of high quality. In the rest of the text the authors illustrate their general remarks by numerous photographs and with details of individual patients. This method demands close attention from the reader, but is more valuable than any attempt to derive rules of thumb from massed statistics where circumstances are so various. The authors insist that technique must be elastic. They use surgery perhaps more freely than workers in this country, where radiology has to a large extent superseded it, but their records include many advanced cases, which could only be treated by extensive surgery, supplemented by radiology, diathermy, the soldering-iron cautery, and even occasionally a "cancer paste." These big operations were followed by plastic repair of the face (illustrated in 64 plates), which was also regarded as part of the work of a team treating cancer. The work of Butlin on the tongue is repeatedly and appreciatively mentioned. The authors do not believe that radiology can deal effectively with secondary disease in lymph glands, either prophylactically or when the disease has declared itself; they prefer to perform block dissections of the neck and have not experienced an unduly high post-operative mortality, even in elderly patients.

Handbook of Medical Jurisprudence and Toxicology

(8th ed.) WILLIAM A. BREND, M.D. Camb. London: Charles Griffin and Co. Pp. 329. 10*s*. 6*d*.

THIS edition differs from its predecessors only in the introduction of new chapters on mental disorders and on the giving of medical evidence. Dr. Brend is chiefly concerned with civil proceedings and the assessment of medical evidence of the kind given in the special courts in which such hearings take place. He tells us less of the experiences of the pathologist, the police-surgeon and the general practitioner, though he deals carefully with them. A chapter on pregnancy and legitimacy—which also covers paternity and forensic blood-grouping—is followed by sections of about half as long on criminal abortion and infanticide, whereas these are of more everyday occurrence. One reason why this book has become so justly popular is its success in presenting briefly and accurately all the broad facts and smaller details of toxicology.

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SURGICAL ANTISEPSIS IN WAR TIME

"The war brings with it fluctuating difficulties in the supply of various materials used in everyday medical practice; and some of these, also, are urgently needed in the armament industry. Glycerine is an obvious example, and, in combination with iodine, was recently advocated in these columns for the treatment of wounds sustained in air raids. If there are other applications equally efficacious—as indeed there are—they should be used in preference to any that contains glycerine. Another substance we would urge practitioners to use sparingly is alcohol, whether in the form of surgical spirit or of medicinal tinctures."

Brit. Med. J., 1941, May 24th, Page 784.

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THE LANCET

LONDON: SATURDAY, JANUARY 10, 1942

STARVING-OUT BACTERIA

To cure disease by starving the pathogen is an attractive suggestion which was expressed shortly after the microbial nature of many ailments became known. A banting regimen was proposed for the invading organism; but who would have pictured it in the situation in which a sulphanilamide-treated streptococcus is now conceived: surrounded by substances essential for its growth, but of which it cannot make use? Suggestions that therapeutic agents affect processes of nutrition in the organisms which they inhibit date at least from the time of EHRLICH, but their exact demonstration is recent. Several workers showed that media suitable for growth of streptococci were rendered unsuitable by sulphanilamide but that the organism could again grow on further addition of natural extracts to the sulphanilamide-containing media. Good presumptive evidence was given by WOODS[1] that the active material in these extracts was *p*-aminobenzoic acid and this has been confirmed by RUBBO and GILLESPIE,[2] whose paper appears on another page. The only action of sulphanilamide under these conditions is to make the organism nutritionally more exacting, for *p*-aminobenzoic acid is demonstrably not needed for the normal growth of streptococci. FILDES[3] was however able to suggest, by analogy with work on other bacterial nutrients, that *p*-aminobenzoic acid was probably an essential substance for at least all organisms susceptible to sulphanilamide inhibition, but that it need not be supplied preformed because most organisms themselves synthesised it. RUBBO and GILLESPIE support these conceptions by their demonstration that *p*-aminobenzoic acid is necessary for growth of *Clostridium acetobutylicum* (W) which in its normal growth thus suffers from a disability induced in other organisms by sulphanilamide.

A point stressed by these workers is the quantitative discrepancy between the interacting quantities of *p*-aminobenzoic acid and sulphanilamide, which are consistently in the ratio of about 1 : 25,000. Immediate chemical reaction is thus unlikely, and WOODS interprets his results in terms of an enzyme which uses *p*-aminobenzoic acid. Sulphanilamide inhibits the enzyme because it is similar enough in structure to attach itself to the points at which *p*-aminobenzoic acid must be linked for normal activity and growth. But the enzyme has much greater affinity for its normal substrate, *p*-aminobenzoic acid, and a very large excess of sulphanilamide is necessary to displace this from the enzyme. Since most tissues and effusions contain *p*-aminobenzoic acid, the large amounts of sulphanilamide therapeutically necessary can be understood. Deleterious effects of sulphanilamide on the patient are explained by the tissues not only containing but needing *p*-aminobenzoic acid.

1. Woods, D. D. *Brit. J. exp. Path.* 1940, **21**, 74.
2. See also *Nature, Lond.* 1940, **146**, 838.
3. Fildes, P. *Lancet*, 1940, i, 955.

Discovery of new chemotherapeutic agents is still largely made by empirical methods. Practised chemotherapists will shrug when asked why they made particular compounds. It is usually by flexible analogies with previously successful agents or other natural compounds, or simply by the preparation of all available substances of a given type. As was indicated by FILDES, and has now been brought out by RUBBO and GILLESPIE, the structural similarity between the essential substance *p*-aminobenzoic acid and the inhibiting agent sulphanilamide presents a new type of guide to the synthesis of chemotherapeuticals. The suggestion that compounds similarly related to known essential substances should be prepared has yielded several new inhibitory compounds. For its further development this suggestion requires that other known inhibitory substances be investigated nutritionally in order to provide further models of this type. No chemotherapeutic millennium is at hand—not all inhibitory compounds act as does sulphanilamide nor are all inhibitory compounds therapeutic agents—but one new and more rational method has been added to those already available in chemotherapeutic research.

COLD FEET

COLD is now playing a more decisive part in warfare than at any time since 1812, and the treatment of its effects is agitating the minds of medical men on both sides. The German armies in Russia, poorly equipped for an intensive winter campaign, and with their medical services disorganised, are gaining all the experience of frost-bite which we could wish, and the amount of disability which will ultimately result from this experience must be enormous. Our own forces on land are not yet being exposed to the effects of extreme cold on the same scale, but smaller numbers of the Royal Air Force have already been subjected to analogous conditions throughout two winters while engaged in long flights high up over sea or continent. But the surface of the body is by nature highly immune to dry cold, and live skin, in what is called super-cooling, can be brought to a temperature 5, 10 or even 15 degrees below the freezing-point of water without actually congealing. Like a supersaturated solution it requires a crystal to initiate the change from fluid to solid. In this war we have not seen much of the effects of prolonged exposure to lesser cold, such as produced 3000 cases of "trench foot" in our First Army between December, 1914, and February, 1915. This condition, as was recognised in the Crimean War, can arise even when the temperature is above freezing point—alternating frost, thaw and rain is the ideal weather for its production. It is seen when men have to spend long periods standing or crouching in waterlogged trenches with no facilities for lying down when off duty. Additional factors are long, rapid marches preceding these periods, ill-fitting boots, and lack of provision for frequent changes of socks and footgear. We have, however, seen something of two closely allied conditions—"immersion foot" and "shelter foot." Immersion foot is seen, for example, in those bomber crews who are forced down on the sea and spend hours or days sitting in a rubber dinghy with their feet awash. Shelter foot was one of the trials of those modern troglodytes, more particularly

the elderly and obese, who spent their nights sitting with legs unsupported, often with the pressure of a deck-chair's cross-bar further impeding the circulation; with the coming of bunks it disappeared.

RAYMOND GREENE,[1] who had experience of the effects of cold on the extremities as medical officer to the Himalaya expeditions of 1931 and 1933, has lately discussed their prevention and treatment. Prevention, he points out, involves not only preventing chilling but also guarding against damp, circulatory stagnation from mechanical causes, anoxia, trauma and nutritional deficiency. The incidence of trench foot fell rapidly in the last war with the institution of foot-drill, with careful attention to drying of socks, boots and gum-boots, and draining of trenches. Systematic inunction of whale-oil was also found of great service, and the provision of whale-oil in rubber dinghies might help to prevent immersion foot. In our aircraft preventive measures—attention to details of clothing, and in the larger machines warming the interior by using the exhaust gases—have proved highly effective. The layman's traditional treatment for frost-bitten extremities has been cold friction rather than warmth. "Rub the part with snow" is an arresting paradox which sticks in the memory, and until lately this would have been the advice of most medical men, whose experience of clinical frost-bite is usually nil. GREENE labels this practice extremely dangerous. When foot or hand goes numb he would at once apply warmth, but never greater than body heat, and would never apply friction. If the circulation still does not return he would dry and wrap up the affected limb and give it absolute rest, warming the patient himself with hot drinks and adequate clothing, but forbidding the excessive warmth of a hot cradle. Heat, he maintains, will increase the metabolism of a part already endangered from anoxia, so that the frostbitten part should be kept neither hot nor cold but cool. During trench warfare tetanus sometimes originated from infection of an insignificant blister associated with trench foot, so that antitetanic serum should be given. In the last war many men had their frostbitten limbs amputated as an emergency measure—some even in hospital train or hospital ship on the way home—but it came to be realised, as GRATTAN brings out in his chapter in the official history,[2] that however alarming the limb may look it is never right to amputate at once. Spreading sepsis may require early amputation, but where the gangrene is dry, as it usually is, a line of demarcation should be awaited. This need for conservatism is the main lesson that emerges from GREENE'S paper, and he gives an example to show that even when the feet are black and hard to above the ankle the patient may escape with the loss of no more than a few phalanges. At the conclusion of three Holme lectures[3] on the effects of cold upon skin Sir THOMAS LEWIS remarks that the reactions of the skin to heat and to frost are fundamentally similar. The rational treatment of the lesions of frost-bite and scald therefore have much in common. While fortunately we have little practical acquaintance with frost-bite, we should make full use of recent experience in treating similar lesions resulting from heat.

1. *Lancet*, 1941, ii, 689.
2. Grattan, H. W. History of the Great War. Medical Services; Surgery, vol. ii, p. 176.
3. *Brit. med. J.* 1941, ii, 795, 837, 869.

SHOCK AND HÆMORRHAGE

ACCORDING to HARKINS,[1] the essential features of shock are the same whether it is due to hæmorrhage or to trauma. He quotes BLALOCK, who alternately bled and transfused dogs in such a way that although more blood was ultimately reintroduced than had been removed their blood-pressure was kept low for several hours. This consistently low blood-pressure was thought to be the cause of the state of shock which finally developed. HARKINS maintains that the primary factor in shock is oligæmia, whether arising from loss of blood in hæmorrhage or loss of plasma by exudation in a traumatised area. In spite of constriction of the larger vessels the blood-pressure falls, tissue anoxæmia results and general loss of capillary tone with increased permeability may follow. It is true that in all forms of shock the skin is pale and cold, while sweating, nausea and vomiting are present and the pulse is slow, but in shock due to hæmorrhage in dogs who had lost 25% of their blood capillary tone was maintained and permeability to water, salts, proteins and certain dyestuffs was preserved.[2] HARKINS would explain this contrast with traumatic shock on the grounds that in simple hæmorrhage the sequence of events is so dramatic that the subject is either rapidly killed or else has his blood-pressure restored by energetic treatment. He says too that hæmorrhage and trauma usually occur together and it is undesirable to distinguish between shock due to either cause. But while severe trauma is usually accompanied by hæmorrhage the reverse is not true—minor war injuries may result in copious bleeding—and a clinical distinction is desirable. Further, the evidence against a toxic factor in shock is far from complete. In trauma there is often definite evidence of moderate or severe renal damage; in hæmorrhage deficient renal circulation causes a fall in the output of urine and a slight rise in the non-protein nitrogen of the blood, but death if it occurs results from general tissue anoxia at a time when damage to the kidney by local anoxia is still slight. If at a late stage remedial measures are successful, recovery of renal function is rapid and complete.[3] It is this greater tendency to recover with adequate treatment which distinguishes shock due to hæmorrhage and which makes recent studies on the subject of special interest. SCHNEDORF and ORR[4] found that when dogs are bled their condition remains almost unaltered for a time, but later collapse occurs and its onset is sudden, rapid and severe; the arterial oxygen tension only falls slightly but the amount of oxygen in the venous blood is greatly decreased, and muscular movement associated with the hyperpnœa increases the oxygen want. Although the decrease in arterial oxygen is small, SCHNEDORF and ORR found the administration of oxygen of value. Most of their dogs died if more than 30% of the blood was removed rapidly, but those receiving oxygen tolerated a 15% greater loss before death, which took place in 3·6 hours as compared with 3·08 hours in untreated dogs.

In man the findings are similar.[5,6] Human volun-

1. Harkins, H. N. *Surgery*, 1941, **9**, 231.
2. Price, P. B., Hanlon, C. R., Longmire, W. P. and Metcalf, W. *Bull. Johns Hopk. Hosp.* 1941, **69**, 327.
3. Black, D. A. K. *Lancet*, 1940, ii, 618.
4. Schnedorf, J. G. and Orr, T. G. *Surg. Gynec. Obstet.* 1941, **73**, 495.
5. Wallace, J. and Sharpey-Schafer, E. P. *Lancet*, 1941, ii, 393.
6. Ebert, R. V., Stead, E. A. and Gibson, J. G. *Arch. intern. Med.* 1941, **68**, 578.

teers have given amounts of blood varying between 700 and 1200 c.cm. This first caused some quickening of the pulse which later slowed with the onset of symptoms of shock and actual fainting. A psychic factor could not be excluded and was probably important. Yet the collapse at the close of or shortly after the bleeding suggests that emotional reactions were secondary, and that the chief factor was circulatory disturbance. Typical signs of shock were recorded, including profuse sweating which tended further to decrease blood-volume and to augment the symptoms. If donors were reclining, faintness usually disappeared in a couple of hours but was very liable to reappear if they got up. Blood-pressure recovered more slowly, the fall sometimes enduring for many hours. The restoration of blood-volume was slow, usually taking about three days to be complete. It was accomplished by the appearance of new plasma in the circulation equal in volume to the sum of plasma plus red cells removed by bleeding; the replacement of red cells occurring at an even later date and presumably being accompanied by an equivalent fall in the volume of total plasma. During the first hour or so after the bleeding there is comparatively little replacement of fluid; thus if about 1000 c.cm. blood is removed compensatory replacement of plasma amounts to only 200 c.cm. Hæmoglobin and plasma protein fall, showing that dilution by a protein-poor fluid has occurred. Plasma volume subsequently increases pari passu with a rise in the concentration of plasma protein to normal during two or three days. The inference is that fluid can only be retained if protein is produced to hold it in the circulation. Such compensatory plasma protein is not held in immediate reserve but its appearance follows the physiological stimulus of decreased plasma volume. In support of this view it is observed that the administration of saline usually results in a very transient increase in blood-volume, and the fluid is soon excreted and largely disappears from the circulation. According to WALLACE and SHARPEY-SCHAFER[5] initial dilution of blood shortly after hæmorrhage is slight, and they agree with EBERT, STEAD and GIBSON[6] in finding that the maximum fall of hæmoglobin due to dilution may take from one to three days. Both papers record cases of over-compensation where dilution was apparently in excess of the blood removed. EBERT and his co-workers remark, however, that all methods of estimating blood-volume are subject to limitations; they depend on the ratio of plasma to cells, which differs in large and small vessels.

Compensation after severe hæmorrhage is considered to take place as follows. Contraction of peripheral vessels in less important organs restricts the circulatory blood to vital centres. Reduction of oxyhæmoglobin by the tissues is much more complete than normal and the exchange of oxygen and especially carbon dioxide in the lungs is enhanced by hyperpœna. Dilution of the blood with protein-poor fluid, followed by the formation and passage of new-formed plasma into the blood-stream, restores the head of pressure in the vessels. Finally, erythrocytes are regenerated and the oxygen carriage is restored to normal. EBERT and his co-workers report that, in contrast with the findings in dogs, severe hæmorrhage in man calls forth neither contraction of the spleen nor the passage of large amounts of reservoir blood into the active circulation. These various investigations all reaffirm the necessity for early and thorough treatment of shock. When hæmorrhage is the chief factor blood-transfusion is the first choice, with the administration of plasma or serum a good second. In severe cases the administration of oxygen through some efficient apparatus may help.

MIDWIVES AND THEIR COLLEGE

A WOMAN who assists others in childbirth (OED definition) has this advantage over her fellow assistants that she works in a protected area and is herself protected from unqualified competition. Anyone can call herself a nurse and attend on sick folk whether she has qualified or not for the Nurses Register; the midwife, unless her name appears on the Roll of Midwives, is not a midwife at all, but a miscreant. The roll was established in 1903, being a list of women certified by a central board (C.M.B.) under the Midwives Act 1902, but uncertified women were not prohibited from practice until nearly 7 years later. It was during this period that it was useful to distinguish between a midwife and a certified midwife. Now there is no need. "Sudden or urgent necessity" is the reasonable and only legal excuse for amateur midwifery.[1] The designation "State Certified Midwife" dates only from 1934, and was introduced to improve the title and assist the status of midwives. Then for the first time, at the instance of the Midwives Institute, an abbreviation was officially allowed and the honourable letters "S.C.M." along with the honourable badge replaced the curious habit which had grown up of saying "I have taken the C.M.B." This coincided with another symbolic event when the Midwives Institute, founded in 1881 and incorporated in 1889, came into possession of a house at 57, Belgrave Street, worthy of its status and activities, justifying the change of name to "College of Midwives" announced at a luncheon on Dec. 11, 1941. Had PETER CHAMBERLEN (of forceps fame) had his way this college would have come into being 225 years earlier, but, as Prof. MUNRO KERR has reminded us, CHAMBERLEN was prosecuted for unqualified practice—he was son of a Paris surgeon and a Protestant refugee—and our midwifery practice took the wrong turning. At this same festive occasion the Minister of Health told of the steps he had taken to ensure the right of midwives to have a voice in determining a scale of salaries. For in the workaday world vocation, status and salary are a triplet with a common placenta. Midwives, it is clear, do not want to be regarded as a part of nursing, but as an independent branch of the profession. The Midwives Institute have put it this way: "A midwife possesses certain rights, privileges and obligations which are conferred upon her by law. Her title and sphere of work are protected and if she elects to practise she is an independent practitioner. Her status is on a different plane from that of a nurse." The corollary is that they must provide a training at least as good as that of nurses in this country and of midwives in other countries.

Data for the official Medical History of the War should be sent to the editor-in-chief, Sir Arthur MacNalty, Room 208, Caxton House West, Tothill Street, London, S.W.1.

1. *See* L. Farrer Brown: Habitually and for Gain. *Lancet*, 1941, ii, 548.

Annotations

A NEW BLOOD-GROUPING

WE are now resigned to the fact that the four blood-groups of Landsteiner are not the whole story of the individuality of the blood. In addition to the classical groups A, B, AB and O, with their antigenic (agglutinogen) factors in the red blood-cells and corresponding opposite isoagglutinins, other important factors have been described. The M and N factors were discovered by using immune sera prepared by injecting human blood-cells into rabbits; Landsteiner and Levine showed that all human beings can be grouped as M, N, or MN, and that these factors were inherited independently of the classical blood-groups. This discovery, though genetically useful and applicable to paternity tests, did not complicate the blood-transfusion situation because these factors were agglutinogens only and no corresponding agglutinins were produced in human blood. When we give a blood-transfusion we try to provide red cells which will not react with *agglutinins* present in the recipient's serum, otherwise the donor's cells may be destroyed and the recipient suffer grave or even fatal reactions; only factors that produce agglutinins are therefore important so far as safe transfusion is concerned. For this reason the subdivision of group A does not seriously concern the transfusionist, with the exception of the few members of group A_2B whose serum contains anti-O agglutinin. The group A_2B is distinguished by the weak reaction of the cells with standard anti-A sera, and in practice its existence makes it advisable to carry out proper cross-matching tests when transfusing group AB recipients and to avoid group O blood unless such testing is available.

Another agglutinogen studied by Landsteiner and Wiener [1] was discovered by the use of serum prepared by injecting rabbits, or better guineapigs, with the blood of rhesus monkeys; this factor was designated Rh. About 85% of normal white people showed this factor in their blood, about 15% were Rh—. As in the case of the M, N factors, iso-antibodies for the Rh do not normally appear in human serum, but cases have arisen in which the anti-Rh antibodies have occurred and serious post-transfusion reactions have been traced to their presence. Wiener and Peters [2] described four such cases of hæmolytic reaction following transfusion of apparently compatible blood, and Wiener [3] himself later described further cases. All these patients had Rh— cells and the reactions occurred after transfusion of Rh+ blood. The mechanism seems to be that a certain proportion of Rh— persons can produce anti-Rh antibodies if they are transfused with Rh+ blood. At the first transfusion there is nothing more than a slow, often unnoticed, hæmolysis of the Rh+ cells, but they have been recognised as foreign and antibody has been produced against them. Consequently the next transfusion of the Rh+ cells is followed by all the phenomena of an incompatible blood-transfusion—in one case the patient died. From this explanation Rh incompatibility would only be expected in patients receiving second or subsequent transfusions; but an interesting exception has arisen in transfusions given for intra- or post-partum hæmorrhage when cases of Rh incompatibility have been reported with the first transfusion. The reason for this is thought to be as follows. Landsteiner and Wiener calculate that about 72% of children from all Rh+ × Rh— matings should be Rh+; an Rh— mother with an Rh+ child may develop anti-Rh antibodies in response to the fœtal agglutinogen; if such a patient is transfused with Rh+ but otherwise compatible blood, transfusion reactions may follow. The practical conclusion from this work is clearly that Rh— recipients should be transfused from Rh— donors, especially when transfusion is needed for the complications of pregnancy. Wiener says that for such a patient, say of group A, it is safer to give group O Rh— blood than group A Rh+. This is easier said than done—it necessitates either special guineapig sera or serum from a human being known to contain anti-Rh antibodies. Neither of these are readily available, but if they can be obtained, Wiener recommends that a register of Rh— donors should be kept so that Rh— blood could be reserved for patients in whom Rh incompatibility might arise. Wiener also thinks that some of the reactions that have been attributed to the use of group O blood as "universal donor" were really due to the Rh factor. It is known that some group O sera have exceptionally active anti-A and anti-B iso-agglutinins and such bloods are thought to be unsuitable for transfusion into patients of other groups. Witebsky and Klendshoj [4] have been investigating the possibility of absorbing these agglutinins with isolated A-specific and B-specific substances and report good results, but these substances are difficult to prepare. The really safe universal donor can at present be defined as a group O donor with Rh— cells and weak isoagglutinins in the serum. Such blood will be safe for all except those fortunately very rare recipients whose serum contains anti-O isoantibodies.

This work on property Rh, the detection of anti-O isoantibodies and the reported isolation of an O-specific substance [4] warns us that blood-grouping is a much more complicated affair than was originally thought. But a sense of proportion will be maintained if we remember that only 1 out of 7 persons is Rh—, that only some of those develop serious anti-Rh reactions and that persons with anti-O serum are much rarer. All the same, we have been warned, and the means of guarding against these snags ought to be developed by the transfusion services.

CARDIAC REFERRED PAIN

SINCE Heberden's classic description of angina pectoris it has been known that the pain of myocardial ischæmia may radiate to areas of the body well removed from the sternum. But it has not been widely appreciated that such pain may arise in a paroxysmal manner in the face, arm or leg without any substernal distress, although Heberden clearly described one such case. Perhaps the commonest site for this extracardiac pain is at the wrist or elbow, and Mackenzie, Osler and Allbutt all stressed the diagnostic puzzle such cases often present. The clue that leads one to suspect the coronary origin of such paroxysms is precisely the same that points to the heart in cases of substernal distress. In both the onset of pain is related to effort, and instances are met with in which, without any chest pain, death has followed. A man may be walking uphill when he is seized with pain in both palms or wrists and dies suddenly. In other cases the peripheral pain precedes the onset of chest pain by many years. There is another group of cases in which coronary artery disease is associated with chronic pain in the shoulder or arm. Askey [5] has reported the phenomenon in 22 patients, all of whom showed indisputable clinical and electrocardiographic evidence of coronary-artery disease. Coronary occlusion was diagnosed in 18 and angina pectoris in 4. The syndrome consisted of pain and stiffness in the shoulder and hand, usually on the left side, with swelling of the hand. It resembled an attack of periarthritis and was always coincident with or followed coronary occlusion or persistent angina pectoris. The pain was rather intractable and sometimes persisted for months. Improvement was gradual and treatment was of little help. Sometimes there was evidence of pre-existing mild arthritic changes but the cardiac attack produced a sudden exacerbation. This is

1. Landsteiner, K. and Wiener, A. S. *J. exper. Med.* 1941, **74**, 309.
2. Wiener and Peters, H. R. *Ann. intern. Med.* 1940, **13**, 2306.
3. *Arch. Path.* 1941, **32**, 227.
4. Witebsky, E. and Klendshoj, N. C. *Science*, 1941, **94**, 256.
5. Askey, J. M. *Amer. Heart J.* July, 1941, p. 1.

not the first report of such cases. Howard [6] described 5 similar ones, Edeiken and Wolferth [7] reported 14 patients with persistent shoulder pain following myocardial infarction, and Boas and Levy [8] 21 cases. Spillane and White [9] in discussing atypical cardiac pain referred to both types of case—those with paroxysmal pain and those with chronic pain. They considered the possibility of the chronic pain being a true referred pain, as it undoubtedly is in the paroxysmal type. They recorded the development of herpes zoster [10] in anginal subjects and noted its relationship to the distribution of the referred pains. The occurrence of herpes zoster over other painful viscera was recalled—in biliary and renal colic, in pleurisy, pericarditis, appendicitis and arthritis—and also the occurrence of other skin lesions along the tract of anginal pain. Mackenzie observed a case in which the lesion took the form of a band of ecchymoses, six inches in length, along the arm. Finally, Spillane and White quoted the 3 reported cases in which the pain of anginal attacks was replaced by paroxysms of homolateral sympathetic stimulation.[11] In Gibson's case there was dilatation of the left pupil and in all 3 unilateral hyperidrosis of the face, neck, upper chest and arm. Such reports seem to suggest that not only may referred cardiac pain be sometimes chronic and not paroxysmal but also that other, non-painful, phenomena may be of referred cardiac origin.

VARICOSE ULCERATION OF THE LEG

Ratschow of Wittenberg[12] describes the local circulatory failure associated with varicose ulceration as taking place in three stages. The first he terms "phlebektasia," a state in which the veins are lengthened and prominent but the muscular coat is hypertrophied and the valves show no histological change. This condition is seen, for example, in the legs during pregnancy, and Ratschow believes it to be reversible. To lead to ulceration the veins have to go through the two further stages of compensated and uncompensated varicosity. In true varicosity there is atrophy of the muscle coat with secondary hyperplasia of the connective tissue, while the intima is thickened either diffusely or in patches. The tendency is for the circulation at the periphery to be reversed, but in the less severe cases the embarrassment of the circulation is compensated. When it is not, the collateral veins become engorged, and backflow occurs into the neighbouring capillaries and may even invade the capillaries on the arterial side. The chemical change induced by stagnation in the tissues produces spasm of the walls of the arterioles. Local necrosis leading to ulceration is said by Ratschow to be a direct effect of vascular failure due to this spasm. His treatment of varicose ulcer is to put the patient to bed with the foot raised above the level of the knee, in order to arrest the swelling as rapidly as possible. He then gives doses of artificial sunlight locally over 48–72 hours, and follows this by the local application of sex-hormones in the form of ointment (Progynon-B oleum and Cyren-A Salbe). The rationale of this treatment is not very clear, but seems to have some connexion with the local production of acetylcholine and its vasodilator effect, and Ratschow, at least, is fully convinced of its efficacy. Obliteration of the veins and pressure bandaging are used in combination with these local measures, and the patients are also given injections of œstrin and testicular extracts. The connexion between this hormone therapy and the healing of the ulcer is even more difficult to follow than the local effect. Haase,[13] discussing the surgical aspects, reminds us that emboli are rather commoner after resection of veins than after injection treatment, and that this fact should be taken into consideration when deciding which to do. In the presence of a positive Trendelenburg test he does not inject but uses ligature with partial resection; where there are numerous veins not obviously leading to one single trunk, he does multiple resections. In some of the worst cases he adopts Nussbaum's plan of making a circular incision. The incision is made through the thickened skin all round the ulcer and carried down as far as the fascia. The wound gapes fairly widely, showing how tense the scar tissue round the ulcer has become. The knife also divides many of the capillaries which have been engorged by the backflow from the varicose veins, and these are driven to finding a new outlet by way of the deep veins. They usually succeed, with the result that the granulations within the circular incision soon become red and healthy, in contrast to the tissues outside, which retain the bluish colour typical of stagnation. Once the ulcer is covered with healthy granulations it can be skin-grafted. Haase says that the immediate results are almost always good as long as the patient remains in bed, but relapse is common when he gets up.

6. Howard, T. *Med. J. Rec.* 1930, **131**, 364.
7. Edeiken, J. and Wolferth, C. C. *Amer. J. med. Sci.* 1936, **191**, 201.
8. Boas, E. P. and Levy, H. *Amer. Heart J.* 1937, **14**, 540.
9. Spillane, J. D. and White, P. D. *British Heart J.* 1940, **2**, 123.
10. *Ibid*, 1939, **1**, 291.
11. Gibson, A. *Brain*, 1905, **28**, 197; Palmer, R. S. *Amer. Heart J.* 1930, **5**, 519; Holt, E. *Amer. Heart J.* 1930, **5**, 522.
12. Ratschow, M. *Dtsch. med. Wschr.* 1941, **67**, 503.
13. Haase, W. *Ibid*, p. 511.

SALVAGE OF PAPER

"What I tell you three times is true."—*Lewis Carroll.*

WE appeal for the third time to the 66,356 doctors whose names appear in the current Medical Directory to make a clean sweep of any idle paper in their possession. At a modest estimate of 1 cwt. a head this would contribute 3500 tons of paper towards all those munitions of war mentioned in last Sunday's broadcast. In medicine, more than in any other profession, the dead wood of the past can safely be cut out and the future be left to the propagation of contemporary shoots. For the most part our shelves carry the record of forgotten things which will have no meaning for our heirs and be only a burden to our executors. Let all this paper be put into circulation again now. It will at least help to ensure the freedom of thought without which the printed word has no value to such as us.

ST. LOUIS ENCEPHALITIS AND EQUINE ENCEPHALOMYELITIS

IF parasitic infections are classified according to what may be called their œcology (or shall we say the home life of the parasites?) it is seen that they are all variations, if not on a single, at least on but a few themes. This is particularly true of virus diseases, many of which have as their leitmotiv the decrease or more commonly the increase in pathogenicity of the virus as a result of its transference from one species of animal to another. Two interesting examples of this variation in pathogenicity with transference have come to light in connexion with St. Louis encephalitis and equine encephalomyelitis, two diseases which though quite distinct immunologically are now seen to be closely related œcologically. St. Louis encephalitis was, as the name implies, first encountered in the neighbourhood of St. Louis as well as in Kansas City and Paris (Illinois) in 1933. Equine encephalomyelitis was at first thought to be a disease of horses in North America till in 1937 both the eastern and the western forms of the disease were found to be causing a highly fatal encephalitis in human beings, especially children. For the past few years in the states of Washington and Colorado encephalitis has occasionally been noted among human beings, but it was not till 1939 that in the Yakima Valley in Washington the cases were sufficiently numerous to constitute an epidemic. While encephalitis was seen in men a few instances of encephalomyelitis also occurred among horses. In 1940 encephalitis was again prevalent among men and horses both in Washington and in Colorado. A study of these two outbreaks has shown that they were caused by two

viruses, the St. Louis encephalitis virus and the western strain of equine encephalomyelitis virus. Hammon,[1] in the Yakima Valley, has found that of 50 people who had clinical symptoms of encephalitis 42 had immune bodies in their blood to the western equine encephalomyelitis virus and 36 to the virus of St. Louis encephalitis, while 28 had immune bodies to both. An examination of sera from 75 people who had not had encephalitis but had lived in the same area showed that 3 had immune bodies for the western equine encephalomyelitis virus, 19 for the St. Louis virus and 2 for both. Philip, Cox and Fountain[2] in Weld County, Colorado, obtained very similar results. An examination of the sera of 14 people ill in 1940 showed that 7 gave protection against St. Louis virus, 1 of these 7 also protecting against western equine encephalomyelitis; of 5 sera from people ill in 1938 and 1939, 4 protected against St. Louis virus and 1 against equine encephalomyelitis. In addition immune bodies to both viruses were present in the blood of horses, so that western equine encephalomyelitis and St. Louis encephalitis must both have been present in Colorado from 1938 to 1940 in men and in horses. Immune bodies to both viruses were obtained from the bloods of horses in Montana. Following on these results Cox, Philip and Kilpatrick[3] showed that when horses were injected intracerebrally with St. Louis encephalitis virus they suffered from clinical symptoms which were indistinguishable from those induced in horses by the injection of western equine encephalomyelitis virus. The fact that in the western states of America horses not infrequently suffer from two attacks of encephalomyelitis is thus satisfactorily explained. It is also perhaps not very surprising to find that, as might have been expected from the seasonal incidence of the diseases, both St. Louis virus and western equine encephalomyelitis virus have been obtained from wild *Culex tarsalis* mosquitoes caught in the infected areas.[4] Thus the two viruses have the same vector, and from other observations made by Hammon and his colleagues[5] it seems that the two viruses may also cause inapparent infections in the same very large series of wild and domestic animals. Finally there is evidence that western equine encephalomyelitis is either spreading to new areas both in the United States[6] and in Canada,[7] or that, for reasons that are not yet understood, it has extended its range in these areas, from wild and domestic animals in which it is non-pathogenic, to horses and man. In Canada, in the provinces of Manitoba, Saskatchewan and Alberta, western equine encephalomyelitis has been associated during the present year not with St. Louis encephalitis but with a devastating outbreak of poliomyelitis. It is impossible not to be struck by the resemblance between the story of St. Louis encephalitis and western equine encephalomyelitis, as they are gradually being unravelled, and that of yellow fever: here too it now appears that the infection of man is merely an incident in the main life story of the virus, yellow fever being primarily an inapparent infection of animals.

HONORARY FELLOWSHIPS

AT the last meeting of the council of the Royal College of Surgeons of England it was decided to confer the honorary fellowship of the college on Sir EARLE PAGE, CH.M., minister representing the Australian government in London, and on Prof. A. T. JURASZ, dean of the Polish Faculty of Medicine in the University of Edinburgh.

1. Hammon, W. M. *J. Amer. med. Ass.* 1941, **117**, 161.
2. Philip, C. B., Cox, H. R. and Fountain, J. H. *Publ. Hlth Rep., Wash.* 1941, **56**, 1388.
3. Cox, H. R., Philip and Kilpatrick, J. W. *Ibid*, 1941, **56**, 1391.
4. Hammon, Reeves, W. C., Brookman, B., Izumi, E. M. and Jullin, C. M. G. *Science*, 1941, **94**, 328.
5. Hammon, Gray, J. A., Evans, F. C., Izumi and Lundy, H. W. *Ibid*, p. 305.
6. Randell, R. and Eichhorn, E. A. *Ibid*, **93**, 595.
7. Editorial. *Canad. med. Ass. J.* 1941, **45**, 351.

NEW YEAR HONOURS

A LONG list of awards to medical men and women for public service of many kinds will be found on a later page. The awards are spread wider than at any time within our experience and there must be few of us who do not come, as it were, within the penumbra of fame. It is good to move in the circle of those who have deserved well of the community and we are inclined to say with Tiny Tim at the turn of the year: God bless us one and all. Within the circle too are some medical associates to whom we would tender congratulation, among them Mr. George Aylwen, treasurer of Bart's, who becomes a knight, and Miss R. E. Darbyshire, sometime matron of U.C.H. and now matron-in-chief of the joint Red Cross, who receives the C.B.E. Miss Darbyshire was a valued member of THE LANCET Commission on Nursing.

THE ARYAN MYTH

"The blood substance of the German race constitutes so prominent and unique an asset to the world that we should be justified in counting it the duty of the entire human race, in gratitude, to safeguard the Germanic element."

WHEN Gobineau originated his racial theory in 1853, John Stuart Mill observed "Of all the vulgar modes of escaping from the consideration of the effect of social and moral influences on the human mind, the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences." Dr. Joseph Needham, in a clearheaded little pamphlet,[1] reviews the basis of Nazi ideology which has led the Germans into such strange behaviour disorders. Thus he quotes the assertion of Frank set out above and many other Nazi writers in similar vein. He shows how the Nazis could never have taken power unless the world had been divided into two camps after the last war. Hitler was able to play on the hopes and fears of the capitalist countries by threatening them with a rising tide of socialism which he asserted only he could stem. At the same time he was exploiting the German people under the banner of National Socialism. Humans in general are naturally peaceful, and a philosophy of blood and soil had to be pumped into the Germans by continuous propaganda until they came to believe that the German race was the supreme being. If this was accepted, it followed that war and plunder and the extermination of inferior or subhuman races was a logical pursuit. The weakest link in this irrational chain of thought was the first premise that the German race was superior to the rest of the inhabitants of this planet. Scientists were liable to assert that there was no such thing as a German race, that it had no special attributes distinguishing it biologically from any other group of men, and that blood (which in any case is distinct from the germ plasm) has no magic properties. Science had therefore to be dethroned, and a new era of anti-rationalism was ushered in. With the elimination by exile, concentration or liquidation of all scientists in Germany who did not accept the new science came the decline in the output, both quantitative and qualitative, of German scientific publications. Not only were so-called non-Aryan scientists dismissed in Germany, but reference to the work of any such scientists abroad proscribed. If reference to a Jewish author was essential, the work had to be listed separately from the Aryan bibliography. It is instructive to note that a gentile who supports a Jewish scientific theory is termed a "white Jew," and is similarly proscribed; this is the corollary of the Japanese privilege of being accepted as an "honorary Aryan."

THE new extensions to the National Health Insurance scheme (see *Lancet*, 1941, ii, 113) came into force last Monday, when some 500,000 new contributors with incomes of £250 to £420 became potential panel patients.

1. The Nazi Attack on International Science. Joseph Needham, Sc.D., F.R.S. London: Watts and Co. Pp. 47. 6*d*.

Special Articles

"YOUR TEETH"

THE PROBLEM OF DENTAL CARIES

E. VAUGHAN TOMEY, L.D.S. R.C.S.

IT is impossible to write a book which will be acceptable in toto to highly educated professional men and women as well as to the lay public, and in "Your Teeth" Prof. P. J. Brekhus [1] has fallen between two stools. The book is fascinating in parts and tiresome in others, and the distinguished writer rarely speaks with the voice of authority which his readers are entitled to expect. He gives an epitome of the published opinions of workers in many countries—and these though stimulating are often contradictory. The masterly survey of the causes of dental caries and pyorrhœa and of facts relating to the teeth of other races will appeal to students, qualified dentists and doctors alike; but Professor Brekhus claims that the book is designed to enlighten "intelligent people outside the profession who for decades have been told a great many things about the teeth which are not so." If this is his object, the book is probably too technical, though certainly the chapter on the development of human teeth and the teeth of animals, fishes and prehistoric man is written in a manner to interest the lay reader—or perhaps to capture the fancy of dental teachers, for comparative dental anatomy is not taught in American schools. In this country, thanks to the influence of Charles Tomes and John Humphreys, it has always formed part of the curriculum though students are apt to regard it as a waste of precious time.

A BAD START

Professor Brekhus regrets the inadequate attention given to children's teeth in America; English dentists will enter fully into his feelings for the amount of dental care necessary in many schools and infant welfare centres in this country is appalling and the service available generally inadequate. True some authorities provide adequate service—Cambridge is notably good—but in many places the dental service is a mere sham resulting in mutilation of the mouth and features of children by the wholesale premature extraction of deciduous teeth. This is not an aspersion on the dental officers: they devote themselves wholeheartedly to the work, but they are swamped by accumulated neglect in more children than they can possibly treat. For instance, how can a part-time dental officer attending for four sessions a week look after the teeth of three or four thousand children of all ages, when 85% of them need treatment? The state should provide adequate dental care for all children, starting in the infant welfare centres, and this should continue until they are entitled to dental benefit under the National Health Insurance Act. Adequate dental treatment implies inspection every six months, which is the custom followed in Sweden and New Zealand, and which formed part of the dental service in Norway before the war. If children's teeth are treated once a year, as the Ministry of Health stipulates, or once in eighteen months or even longer as sometimes happens in practice, the end-result is not preservation of teeth, but gross oral sepsis leading to the multiplication of tonsillectomies and much general ill health. By the time a child is seen he often needs many extractions, and is left with a mouth incapable of masticating ordinary food; this does not conduce to good nutrition nor does it improve his jaws and features.

POOR TEETH AND POOR HEALTH

The price we pay for this neglect is doubtless high, and there must be some preventive measures we could take in order to avoid such eternal tinkering when the damage has been done. Dental caries is related to heredity, diet, health, environment and occupation. H. P. Pickerill has pointed out that since civilisation itself cannot cause an increase of dental troubles, it must be some particular, though not always essential, accompaniment of civilisation which is responsible. Professor Brekhus has not helped us to put a finger on the common factor, and indeed some of his deductions from the evidence before him seem rather sweeping. He tries to prove, for instance, that there is no relation between good health and good teeth. The teeth of all the athletic students at the University of Minnesota were examined and on the average proved to be no better than those of ordinary students. To find that the best physical specimens had teeth no better than the average was, in the Professor's words, a severe jolt. But it is noteworthy that the athletes were not compared with students in poor health; and there were no data for assuming that the athletes were healthier than the general run of students. Moreover good health is not necessarily continuous throughout life. A man who is perfectly healthy today may have had measles, scarlet fever, stomatitis, smallpox, chicken-pox, typhoid or rheumatic fever at the time when his teeth were being calcified; and being poorly calcified they have probably failed to resist decay, as Professor Brekhus himself admits. In my opinion measles is the outstanding cause of dental decay and oral sepsis in children, as well as of much lifelong deafness; yet our medical authorities do relatively little to get rid of this canker in our national health. Infantile vaccination is another common cause of caries and from the dental point of view it would be better if vaccination were postponed until the age of 6 or 7 when the crowns of most of the teeth are calcified. The relationship between septic teeth and tonsillitis is now generally recognised in school clinics in Great Britain; all septic teeth are now extracted before the tonsils are removed and in many cases the tonsillitis clears up after these extractions and tonsillectomy becomes unnecessary. Yet one of the authorities quoted by Professor Brekhus states: "In the light of our present knowledge the removal of such local infection in the hope of influencing remote and general symptoms and disease must still be regarded as an experimental procedure not devoid of hazard." Certainly septic teeth should not be extracted at the critical stage of any illness, even if they are the direct cause of it; this applies particularly to kidney infections, where extraction of teeth may precipitate a flare up which may even prove fatal. But in this country, where our climate possibly helps to multiply the upper respiratory infections caused by focal infection, we regard the removal of all such foci as necessary, whether they are in teeth, tonsils, sinuses, intestines or urinary tract. It behoves every dentist, however, to make sure that the work he does in the patient's mouth is not a potential cause of ill health.

Professor Brekhus dismisses rather summarily the fact that pregnancy may be one of the causes of loss of teeth. The old saying that a woman loses a tooth for every child is not without its grain of truth. There is seldom general caries; if there is, it suggests deficiency of calcium and vitamin D, which should be given at once in the interests of both mother and child; but quite often one tooth decays and that generally very rapidly. Professor Brekhus compares the incidence of caries in women and men; it is noteworthy that women show a greater percentage of caries during the years of menstruation, but attain the same level as men after the menopause; the loss of calcium in the menstrual flow is a likely explanation. He mentions a theory that anxiety neurosis may be responsible for the so-called caries of pregnancy and suggests that the same neurosis may account for the fact that various members of a family living under the same conditions, and on the same food, may show varying degrees of caries. But it must be borne in mind that the family are unlikely to be eating the same things although a uniform diet may be provided; one won't like cabbage, carrots, or green vegetables, while another will eat his share: and generally speaking the second will be free from caries while the first will not.

TOOTHBRUSHES, NATURAL AND ACQUIRED

Professor Brekhus is also a little wide of the mark in saying that many uncivilised or semi-civilised races practise no dental hygiene. Some at least have a strict ritual, cleaning their teeth with special roots, the ends of which are chewed to form a brush; they often carry such roots round with them in the folds of their garments. I have a bundle of these roots and they undoubtedly

1. Your Teeth. By Peter J. Brekhus, B.A., D.D.S., professor of oral diagnosis, University of Minnesota. London: Humphrey Milford, Oxford University Press. Pp. 225. 15s. 6d.

contain antiseptic and astringent substances. Professor Brekhus has confused oral hygiene with prevalence of the toothbrush—perhaps the dirtiest and most unhygienic implement conceivable. He says, for example, that the Eskimos use no dental hygiene; but they chew the raw hide of seals to soften it and work it into shape; and the children chew lumps of seal blubber—a great advance on the pernicious rubber teat. It is well known—and the figures he quotes confirm it—that many races have perfect dentition until brought into contact with civilisation. When Eskimos come into contact with civilisation they eat the foods of the newcomers and caries becomes common among them. And there are other important factors: civilisation brings such diseases as measles and smallpox; and it also brings refined sugar. Raw sugar cane, chewed by many native children in the West Indies, does not seem to cause dental caries, but refined sugar undoubtedly does. The people of America probably have a sweeter tooth than any other nation and according to Professor Brekhus's figures they have the highest percentage of dental decay—even higher than ours—and that in spite of being more tooth-conscious than any people in the world.

NEW YEAR HONOURS

THE honours list issued on Jan. 1 contains the following names of members of the medical profession:—

BARON

Sir AUCKLAND GEDDES, P.C., G.C.M.G., K.C.B., T.D. M.D. EDIN., LL.D. For public services.

KNIGHTS BACHELOR

RATANJI DINSHAH DALAL, C.I.E., M.R.C.P., D.P.H.
Member of the Central Legislative Assembly of India.

SAMUEL GURNEY-DIXON, M.D. CAMB., J.P.
Chairman of the Hampshire education committee and of the education committee of the County Councils Association.

C.B.

Temporary Surgeon Rear-Admiral GORDON GORDON-TAYLOR, O.B.E., M.S. LOND., F.R.C.S.
Senior surgeon to the Middlesex Hospital.

Lieut.-General ALEXANDER HOOD, C.B.E., M.D. EDIN., K.H.P.
Director-general, Army Medical Services.

C.M.G.

HARRY CHAPMAN SINDERSON, O.B.E., M.V.O., M.D. EDIN., F.R.C.P.E., D.T.M. & H.
Professor of medicine, Royal College of Medicine, Iraq.

THOMAS GEORGE WILSON, M.D. SYDNEY, F.A.C.S., F.R.A.C.S., F.R.C.O.G.
Consulting gynæcologist to Adelaide Hospital.

C.I.E.

Lieut.-Colonel MADAN GOPAL BHANDARI, M.B. PUNJAB, D.T.M. & H., I.M.S.
Inspector-general of prisons, Bombay.

Lieut.-Colonel MARTIN MELVIN CRUICKSHANK, CH.M., M.D. ABERD., F.R.C.S.E., F.A.C.S., D.O.M.S., I.M.S.
Chief medical officer and civil surgeon, Delhi, and lately superintendent of the Government General Hospital, Madras.

Lieut.-Colonel WILLIAM ELLIOT RANDALL DIMOND, L.R.C.P.I., D.P.H., I.M.S.
Lately officiating inspector-general of civil hospitals, North-West Frontier Province.

Lieut.-Colonel ARTHUR HENRY HARTY, M.R.C.S., I.M.S.
Civil surgeon and superintendent B.J. medical school, and superintendent Ahmedabad Mental Hospital, Bombay.

Lieut.-Colonel ROBERT HAY, M.B. EDIN., D.P.H., D.T.M. & H., I.M.S.
Deputy director-general, I.M.S.

C.B.E.

GEORGE CRANSTON ANDERSON, M.D. EDIN., LL.D., F.R.C.P.
Secretary to the British Medical Association.

Colonel (Acting Brigadier) JOHN CECIL ALEXANDER DOWSE, M.C., M.B. DUBL., M.R.C.O.G., late R.A.M.C.

RICHARD LIONEL SPITTEL, F.R.C.S.
Consulting surgeon to the General Hospital, Colombo.

Air Vice-Marshal WILLIAM TYRRELL, D.S.O., M.C., M.B. BELF., D.P.H., K.H.S.

O.B.E.

CYRIL JOHN AUSTIN, M.B. EDIN.
Medical officer, Fiji.

WALTER BIGGAR BANNERMAN, M.R.C.S., D.P.H.
Medical officer of health for Orkney.

Surgeon Commander DRUMMOND REWCASTLE FORBES BERTRAM, M.B. DURH., R.N.

Surgeon Commander HAROLD KEITH CORKHILL, V.D., M.B. EDIN., F.R.A.C.S., R.N.Z.N.V.R.
Surgeon to the Wellington Hospital.

JOHN FARQUHAR DAVIDSON, M.B. ABERD., D.P.H.
Medical officer of health for Somerset.

JOHN LLOYD DAVIES, M.D. LOND., M.R.C.P., F.R.C.S.E., D.P.H.
Part-time E.M.S. specialist and group adviser to the hospital officer, Wales region.

Captain (temporary Major) DEREK ERNEST DENNY-BROWN, D.PHIL. OXFD, M.B. N.Z., F.R.C.P., R.A.M.C.
Professor of neurology at Harvard University.

DESMOND DREW, M.B. DUBL.
Principal medical officer, Swaziland.

(Mrs.) MARY JESSIE GIBBONS, M.R.C.S.
In charge of U.M.C.A. Hospital, Minaki, Dar-es-Salaam.

Major GURDIAL SINGH GILL, M.B. EDIN., I.M.S.
Inspector-general of Prisons, Madras.

STEPHEN DOUGLAS STURTON, M.D. CAMB., D.T.M.
Head of the Church Missionary Hospital, Hangchow.

Lieut.-Colonel DAYA RAM THAPAR, M.B. EDIN., D.T.M. & H., I.M.S.

Squadron-Leader HECTOR MACDONALD WALKER, M.D. GLASG., R.A.F.V.R.

Major JOHN GEORGE GLYN WHITE, M.B. MELB., A.A.M.C.

GEOFFREY COMMELINE WILLIAMS, M.A. OXFD, M.R.C.S., D.P.H.
Medical officer of health for Oxford.

M.B.E.

PALANTHIKAL VARKEY CHERIYAN.
Surgeon i/c of E.N.T. department, Government General Hospital, Madras.

Surgeon Lieut. HERBERT WILLIAM CLEGG, M.B. MANC., R.N.V.R.

JAMES DANIEL DYSON, M.B. LOND., D.P.M.
Medical superintendent, Mental Hospital, Mauritius.

Captain CORNELIUS JEFFCOTT HASSETT, M.B. DUBL., I.M.S.
Agency surgeon, North Waziristan, and medical officer, Tochi Scouts, N.W.F. Province.

HASSAN SHUKRI KHALIDI, M.D. BEIRUT.
Medical officer, Jaffa, Palestine.

Captain and Brevet Major (acting Major) JAMES WILLIAM ARTHUR PARSONS, L.R.C.P.E., I.M.S.

ALOYSIUS XAVIER PEREIRA.
Resident medical officer, civil hospital, Karachi.

SRI RAO BAHADUR TRICHINOPOLY ADIMULAM PILLAI RAJA PILLAI.
Medical practitioner, Coimbatore, Madras.

JOTINDRA MOHAN RAKSHIT, M.B. BOMBAY, F.R.C.S.E.
Chief medical officer, Tata Iron & Steel Co., Jamshedpur, Bihar.

Temporary Surgeon Lieutenant ERIC ANTONY SPOUSE, L.M.S.S.A., R.N.V.R.

(Mrs.) MARJORIE MORTON STEWART, M.B. EDIN.
Joint centre organiser, Women's Voluntary Services for Civil Defence, Kingston-upon-Hull.

Captain (Senior assistant surgeon) KENNETH WILLIAM EVERARD WHITE.
I.M. department.

KAISAR-I-HIND MEDAL

(Miss) ANNA POLLOCK MARTIN, M.D. GLASG., M.R.C.O.G.
In charge of the Muse Memorial Hospital, Nagpur.

(Miss) LOUISA MARGUERETTA POYNDER, M.D. LAUSANNE, M.R.C.S. Medical practitioner, Simla.

ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM.—The King has sanctioned the following promotions in, and appointments to, this order:—

As Bailiff Grand Cross.—Col. Charles Joseph Trimble, L.R.C.P.E.

As Knight.—Richard Clegg, M.R.C.S.

As Commanders.—Roland Nightingale, M.D.; William Egbert Thompson, M.B.; Winstan St. Andrew St. John, M.R.C.S.; Major George Aylwen; John Henry Dain, O.B.E.; Major-General Ralph Bignell Ainsworth, M.R.C.S.; and William Gibson, M.D.

As Officers.—Cornelius Thompson, M.B.; Lieut.-Colonel Albert Jones, M.D.; Robert Rutherford, M.B.; Frank Robert Barnard Howard Kennedy, L.R.C.P.E.; Arthur Burton, M.D.; Norman Manson, M.B.; Frank Samuel Hardy, M.R.C.S.; Harold Edwin Thomas, M.R.C.S.; Archibald Oliver, M.D.; and Alfred George Timbrell Fisher, F.R.C.S.

In England Now

A Running Commentary by Peripatetic Correspondents

THE end of the year has not been uneventful. Just before Christmas Sirene, one of our young virgin goats, began to wail unashamedly for a husband, so we hastily packed her into the car with the children and introduced her to the obliging young billy at Mr. Puddecombe's. "He's served a couple already this morning," said Mr. Puddecombe, "but I daresay as he can manage another." He could. We noted that, as in tennis, he was allowed two services. The grim sequel to this story is that, just a week later, the billy suddenly and quite unaccountably died. There were no marks of violence on the body when it was discovered in the morning by Mr. Puddecombe, who stated that, when he took him his hay ration on the previous night the billy had been in the best of health and spirits and jumping around on his chain. So far as we know he had no financial or domestic problems such as might drive him to suicide; nor was he "blawed," which excludes the "information." At present we are left wondering but are hoping for a postmortem if we can get the consent of his relations.

The polecat ferret, described by its owner as very fierce and wild, who came up on Christmas Eve to bolt the rabbits out of our hedges, went instantly to ground and stayed there. No blandishments, no succulent rabbit's innards scattered round the mouth of the hole could bring him to the surface and he remained underground overnight to the consternation of his owner. On Christmas morning father, mother and two children formed themselves into a working party to dig him out but met with no success. When about to abandon the search we suddenly espied him streaking across the meadow to a neighbouring covert, no doubt to fetch his Christmas dinner. In the very act of getting to ground again he was secured by the tail by mother—father having missed—and was conveyed in triumph to his bag where he consoled himself with some of the less obviously edible portions of Gert, one of our two geese bought as goslings and cruelly fattened for Christmas; Daisy, her sister, was bought by a biologist who took her away on his bicycle (*not* made for two). The baby let the polecat out of the bag later in the day but this time he was secured before he could reach his beloved hedge.

On Christmas afternoon we were entertained by the garage-proprietor, a great amateur of magic, to half an hour of conjuring. Except for a couple of two-year-olds who expressed their boredom and contempt by getting up in the middle and going out into the garden, we were all suitably enthralled and mystified. Father, of course, was the stooge who could be relied on invariably to do or say the foolish thing. He was scored off times without number; it was really rather pathetic. Tomorrow we have to attend a matinée performance of an amateur pantomime and very shortly we have to put our Christmas holiday play into rehearsal. It's a hard life.

* * *

"Why on earth do they keep all the bottles on the floor?" was Durrant's opening question when we entered the mess. I shook him by my monosyllabic reply of "Blast!" but I hastened to explain that the general air of orderliness—the surrounding quietness, the serenity of the late summer sea—belied the true state of affairs, and that fierce activity lay smouldering beneath the surface, ready to break out at any moment into the flames of war. The first time that the bottles and glasses were wrecked was a notable occasion. A small boat far away on the horizon, apparently headed in the direction of the harbour, failed to satisfy the belligerent curiosity of the officer on duty who promptly set in motion a sequence of events which landed me on the mess-room floor in a seat of sherry, beer, gin and whisky, liberally studded with spicules of shattered glass. For the first time, and quite forcibly, I realised that the mess was immediately underneath a gun. And I was told later that the shell landed very neatly ahead of the trespasser's bows, thus signalling the last lap of the voyage to a vessel which eventually proved to contain a cargo of harmless refugees. A less important but simultaneous disaster was the loss of all my bottles of medicine, which had been sedulously scrounged and jealously hoarded over a period of several weeks. The medicine was also kept on the floor after that costly day.

As we were leaving the fort I could not refrain from showing Durrant the black hole where I was expected to treat the sick when I first arrived and to point the contrast to the good conditions in which he would start work. A dank, dark, musty room it was, on the periphery of the building, and the floor had been partly ripped up in the course of alterations that were going on at the same time as sick parade; a gang of workmen were desultorily hacking and hammering at the walls, and so conscientious were they that they declined to down tools even while I was examining the sick. They begged me not to worry and declared that I would not be in their way. This naive opposition to my desires only served to increase my wrath, which was heightened still further when a face appeared in the doorway and ordered me to remain at my post because a visiting brigadier was on his way round. Being green to Army ways I guessed that it must be supremely important for the M.O. to be seen in the dungeon set aside as a sick bay. I was so vividly green, in fact, that I thought what a splendid opportunity there would be to demonstrate to this high dignitary the full horror of the situation and arouse his interest and enthusiasm for immediate improvements. I stood (assuming that the absence of a chair was part of the technique of "toughening the soldiers") for two solid hours, my head reeling with incipient stages of illness, my temperature rising steadily, and my nose dripping in tempo with the ceiling and walls, until at last the august personage arrived. While I stood shivering at the salute he cast a glassy eye around the room, backed on to the toes of his staff, whom he cursed for ever having brought him to such a place, and rumbled off down the corridor muttering and growling. If only I had known. My only consolation was that I heard a few days later that the good man was too ill to attend a firing demonstration.

When we got out into the sunlight again Durrant told me that he was beginning to realise that he was getting off fairly lightly. We stood watching the fishing, one of the chief amusements on the fort, carried out under the critical eye of the "Quarter Bloke," a lordly person whose rumoured exploits had won for him the awe of all the younger fisher men. He owned a small coracle, which he kept on the fort and which gave him instant superiority over the amateur anglers because he could wave his arm airily in the direction of the middle distance, saying: "If this breeze dies down the pollock will be biting over there in about half an hour." Strangely enough, if he deigned to row out and cast a line after making one of these oracular pronouncements he would return with a splendid basket of pollock. It was also alleged that should a bass or a mackerel take the bait on such a day he would promptly return it to the deep, and if questioned about such extraordinary behaviour he would reply: "If I fish for bass I fish for bass. But I don't want them when I'm fishing for pollock." And this even if it meant coming back empty-handed.

But the easiest way of fishing out here is to stand by for an air-raid. Since the bombs usually drop in the sea their concussion stuns and brings to the surface so many fish that the first available man simply rows out and collects a boat-load. Occasionally the Hun is good enough to make a mess of dropping one of his mines; the explosion is then a source of considerable gratification because not only does it portend a fish tea for the whole garrison, but also means that enormous baskets of assorted fish can be sent to friends and relatives.

The *Ladybird*, which now arrived to take us ashore, is perhaps the most cleverly handled craft on the whole coast. In peace-time she conveys holiday-makers on day trips to a resort many miles away. Even when the furies of the sea are raging in their worst temper she will convey mails and rations to the forts, transport the M.O. and collect the sick. There is not much time now before my train leaves, and I have to rush Durrant on and off one fort after another and introduce him to the officers. As the boat carries us in, I give him a brief outline of the remainder of the work; I tell him how the characteristics of the units vary, how welcome he will be for a meal anywhere at any time, how to arrange the timetables for the week; I point out an area of the rocks that is infested with rats, explaining the measures I have taken to try to keep them down; I suggest the best

person to see about the roof over yonder that starts a leak in yesterday's rain, and in general give him all the details of his strange and not very medical occupation. In the afternoons he will be the only M.O. available in the neighbourhood, and will be kept busy training the orderlies and stretcher-bearers ashore, probing into such problems as the sources and preservation of water-supplies and food-supplies in the event of invasion in an advisory rather than an executive capacity; the Army doctor simply has to keep an eye on these matters and be ready to help if required), checking up on the inoculation state of shore personnel, visiting those who fall sick while on leave in the vicinity, occasionally making a second trip to a fort to see a man suddenly ill, or in extreme emergency, meeting him when he is brought ashore. But I know that in spite of all my protestations of the work to be done, Durrant will rarely have to forgo an evening's entertainment.

Approaching land I notice a stray tardy jellyfish floating past on the ebb, and am reminded of a warm day six weeks or so before when scores of these translucent creatures appeared in the harbour, followed by hundreds of thousands, until the ocean seemed carpeted with their protoplasmic masses, quadranted with pink, mauve, red or purple suckers, suspended an inch or so beneath the sunlit water's surface—a sudden freak of nature no less astonishing for their number than their transience. Hardly one remained on the following day.

As I looked back and around at the chain of forts proudly manned by this happy breed of men, and as I watched Durrant set out on his first emergency call I hoped that he would be as lucky as I had been in his personal contacts. There had been an example only a few nights before. During dinner the telephone rang, and I was summoned to the outermost fort. One of the men had cut his eyebrow, and my orderly thought it needed a stitch. I just had time to catch the last duty-boat, a journey never to be forgotten when the night is fine; the cliffs of England, green-topped, mauve-faced in the setting sun standing out boldly, fold upon fold, as far as the enveloping haze, erect on the shores of nature's moat, and the men laughing as they recount the minor adventures of a day ashore—some returning from a week's leave, hard-faced, glad to have an excuse for conversation. It does not take many minutes to suture the wound. The job done, the mess orderly appears with the battery commander's compliments, and would the doctor please step into the mess; the skipper has promised to keep the boat waiting a few minutes longer. "Ah, there you are doc, what have you been doing to that wretched gunner's face? Lifting it? Well now what are you having? . . . Oh yes, all right, Sergeant Major, I know the skipper wants to get back, but tell him that he simply *must* wait for a little longer: tell him the doctor's just found one of the officers very ill (Jimmy . . . report sick at once)." But even the skipper's patience is exhausted, and I am on the boat again; darkling clouds gather, stealing across the sky, the leaden sea scarce returns a glint of light; the cliffs are but a blurred mass far away, towering against early stars that glitter as if set in purple velvet. The engines cease their stroke, a faint rippling rises to the ear as the boat glides to her mooring; men's voices, though hushed, carry far in the twilight, seeming to come from strangely close; a spinning hawser lifts a fleck of spray to the cheek, and as one steps ashore a faintly stirring breeze whispers through the sedge and ushers in the night.

* * *

On the road to knowledge man has often come to what appears to be the end. Here is ultimate truth, he says—a created species, an element, a final conception of the atom. Then after a time he sees it is not really the end; there's a vista trailing off into the unknown, waiting for his searching steps. Prof. Julian Huxley, overwhelmed by the finality of that infant science, genetics, cannot see how personality which depends on a particular set and arrangement of genes can survive their disintegration. His reply in the Brains Trust of a couple of weeks ago reminds me of a pedagogue, an unpleasantly practical young man, holding forth on music: "This affair of wood and gut is called a violin, and if struck in a particular way gives rise to musical noises. Although all violins have peculiarities of their own, they are alike in their essentials. . . ." He has not come within reach of guessing that here is an instrument which when touched by the master hand can speak with an alluring voice to man, can whisper in his ear of worlds unroamed, of passions undefined, of scenes beyond the range of human sight; whose patterns, tossed from mind to mind, from pole to pole, from age to age, can live when it and the hands that conjured them are dust.

* * *

The eldest boy is home for the holidays and his Christmas thank-you letters have confirmed the impression conveyed by his term-time weekly correspondence that spelling is not his strong point. I discussed this with an expert in the scholastic world who assured me that nowadays it is more important to let the young express themselves freely than to hamper them by constant nagging over writing and spelling. Certainly the examination papers brought home for my inspection seemed to bear this out. I could just read them and apparently the masters responsible for correction could too, for they had given good marks. But the spelling was appalling. After the examination papers I was not unprepared for the general tone of the report when it came. "Work and conduct excellent" it ran, and then as an afterthought the young and newly-promoted housemaster had added "spelling week."

Obituary

CLIFFORD STUART HUMPHRIES

M.B. CAMB.; CAPTAIN, R.A.M.C.

Dr. Clifford Humphries, who died from abdominal wounds in the Middle East during November, was the only child of Mr. Stanley Humphries, now of Alsager, Cheshire, and formerly of Blackheath and Sydenham. At Westminster School and Trinity College, Cambridge, he was shy and studious, but at St. Thomas's Hospital with his growing devotion to his profession he expanded. He qualified in 1935 and took his Cambridge degree two years later. After holding house-appointments at the Kent and Canterbury Hospital and the Royal Berkshire Hospital at Reading he went into private practice at Sydenham and Peckham, where his care for his patients was untiring. He volunteered for full service when the national register of doctors was set up, though war was abhorrent to him. He was called up in September, 1939, and in a few weeks he was in France. Later he served in Greece and Crete and it was during the fighting in Libya that he was wounded.

CASUALTIES OF THE WAR

Dr. THOMAS LANGDON BUTLER, of Woodgreen, Hants, was reported missing after his ship was torpedoed in December, 1940, and he is now officially presumed killed. Dr. Butler qualified from St. Mary's in 1901 and retired from the Merchant Navy some 15 years ago. When this war broke out, though 71 years of age, he once more offered his services to the P. and O. line, and he returned to work as a ship's surgeon till he was lost.

The death is announced on Dec. 23 of Captain CLARENCE HENRI-FRANÇOIS DE CHALUS, R.A.M.C. He was born in 1894 and qualified from the University of Edinburgh in 1921. He received his commission in May, 1940.

VITAMINS FOR FINLAND.—The shortage of vitamin C among the Finns is partly being met by Sweden, which is sending them 1000 kg. of vitamin C preparations during the winter. Corresponding quantities of rose-hips collected in Finland are being sent to Sweden, where the firm of Kerngesellschaft A.B. has the apparatus for manufacturing vitamin C preparations. This firm has already supplied large quantities of vitamins to the Swedish army and Swedish Volunteer Corps in Finland.

Letters to the Editor

THE FUTURE OF MEDICAL RESEARCH

SIR,—I read with pleasure the stimulating, if rather utopian, proposals of Dr. Walther in your issue of Dec. 27. Like him, I should welcome an organisation which "accumulates, sorts, keeps in order and renders available everything that is known on every subject," as envisaged by Mr. H. G. Wells. Meanwhile it may be hoped that the advent of such an organisation will be preceded by the adoption of a universal scientific language; abstracts of articles in strange tongues cannot replace a study of the original papers.

I would like to supplement Dr. Walther's article by another suggestion. Often a worker, bound to a specific inquiry, will notice promising side-issues which he cannot pursue because they are beyond the orbit of his own particular investigation. In such an event human nature forbids him to give away his original observations without the prospect of acknowledgment; for the research worker is not well paid and lives largely on his reputation as the owner of a successful and original mind. After all, the novel but sound idea is the most valuable asset for research. It is easier to examine ore for gold than to discover a gold mine, and there are many more people who are suitable for the job. Therefore, I should propose that a Registry of Ideas be started in which could be enrolled under each author's name his suggestion for a new line of research, and the preliminary observations on which his idea is formed. Such a registry would require little financial support and might release for immediate use many a bright notion which at present lies dormant.

HAROLD BURROWS.

Chester Beatty Research Institute, London.

FRACTURED FEMORAL NECK

SIR,—Mr. Tippett, in his letter of Dec. 27 on plaster treatment of fracture of the neck of the femur, refers, I assume, to the abduction treatment. This he regards as a retrogression because of the danger of hypostatic congestion. Actually the chief advantage of the abduction method at the time of its introduction was the prevention of this, and of the other cause of mortality—infected bedsores. The patient was placed on an inclined plane, the head of the bed being raised, and was turned at intervals to the ventral posture. Personally I have had no experience with either of these complications. After the plaster has been removed the patient does not spend "three months in bed between sandbags or splints," but in this interval reconstructive exercises are carried out in order to assure the range of abduction and extension essential to a normal gait. The important question at issue is the influence of the early resumption of activity on the functional result. The nail is doubtless a secure temporary means of fixing the fragments but I doubt if it can be depended on to supplant natural resistance in weight bearing; or that it will so suppress the sensitiveness of the joint during the period of repair as to restrain the tendency toward restricted motion and the protective attitude. Since aseptic necrosis and degenerative changes in the joint are the result of impaired nutrition, it seems to me that the uninterrupted rest advocated by Thomas would favour repair rather than ambulation on crutches.

Mr. Tippett may care to look up my paper on abduction treatment in THE LANCET of 1913 (i, 1649).

The Athenæum. ROYAL WHITMAN.

REGIMENTAL MEDICAL OFFICERS

SIR,—The Army has absorbed and is still absorbing a number of qualified men. These doctors vary greatly in age, length of qualification, and experience in hospital and general practice. Some have been qualified only for a short time and have completed one hospital appointment. Others have been qualified for three or four years, have held several appointments, and see the way opening to the ladder which leads to the coveted eminence of consultants. Others again have been in general practice for ten or more years and have added experience of the world to the lore of the hospital. From each of these diverse groups a considerable proportion become regimental medical officers. It is not surprising if the experienced practitioner and the promising hospital alumnus alike consider that their accomplishments will not be put to their proper or fullest use if they are placed in posts which are also occupied by recently qualified men.

The opinion has become widely held that the duties of a regimental medical officer involve no requirements and offer no scope beyond the knowledge, experience and judgment of a man who has been qualified for six months, and that others are being bureaucratically underemployed if placed in these posts. The hospital alumnus will write to the War Office: "I feel that my special training during three years in hospital will be wasted as an ordinary regimental medical officer." The general practitioner will write (but less frequently) "I feel that my experience in general practice will be more useful in a hospital." The hospital authority desiring to retain a special man writes: "This is a man of experience and judgment whose training will be wasted as a regimental medical officer."

Such views are based on a misapprehension. The health and physical efficiency of the Army lies not in the hands of the hospital surgeon and physician or others of higher rank but in those of the regimental medical officers. To perform their duties efficiently requires considerable judgment and knowledge and many units have suffered from medical officers who may work conscientiously but have insufficient experience. The responsibilities are especially heavy in a training centre and the day's work may be long. The medical officer has to "mother" the recruit over teething troubles, from sore feet to home worries and the anxieties of a new environment, and his hand must be neither too heavy nor too light. A weak medical officer can reduce mediocre men to complete inefficiency, or aid them as they slip willingly downhill. A good regimental medical officer can do more for man-efficiency and man-power than any other officer in the R.A.M.C.

The duties of a regimental medical officer are laid down in the regulations for the Medical Services of the Army. The pages form a somewhat bald and unconvincing narrative, for no touch of human nature is discernible, and so medical officers, like all doctors, must learn their most important lessons outside the covers of a textbook. But one sentence may be quoted: "He (the M.O.) is the adviser to the O.C. unit on all medical matters pertaining to the health of the unit." This is strictly true and its importance is obvious. The position should be reciprocal and in the best units the O.C. is equally the adviser to the medical officer, and consequently a good O.C. usually has a good medical officer. But if the medical officer is too junior and inexperienced he has to struggle for himself with the same difficulties which he is expected to cope with in others, and the position is fair neither to himself nor to the men, nor is it to the benefit of the Army or the state. Consequently it is essential that it should not be considered that training and experience are wasted in these most important posts and that a sufficient supply of suitable men should be available. I repeat, the health and physical efficiency of the Army lies in the hands of the regimental medical officers.

H. LETHEBY TIDY,

War Office. Consulting Physician to the Army at Home.

WHAT'S IN THE LOAF?

SIR,—Lord Woolton is reported in the *Times* of Jan. 2 as having said, "There is no justification for the statement that wheatmeal can, under the terms of the instructions to the trade, consist of white flour and bran." The "terms of the instructions to the trade" have not been published, but there can be no question that the effect of the Statutory Order, No. 1291, 1941, is, as you described it, to "permit 85% national wheatmeal to consist of white flour with added bran," and a Statutory Order must override any departmental "instructions."

Equally unsatisfactory, and indeed fallacious, is Lord Woolton's further statement that the current national wheatmeal loaf is "consistent" in its "content and nutritive value." As long as the safeguards stipulated by the Medical Research Council and quoted in your leader are ignored by the Ministry this wheatmeal loaf must remain suspect, and it is significant that notwithstanding an expensive advertising effort (costing £29,000) dating from the spring of 1941 (*Hansard*, July 9) the proportion of

wheatmeal remains at 5–7% of the bread consumption of our people.

The obvious public anxiety, reflected both in Parliament and in the press, demands an impartial and authoritative examination of the bread position, and I have put down on the Order Paper of the House of Commons the following motion (Dec. 8) which has already obtained wide support from members of all parties.

Wheatmeal bread,—"That a select committee be appointed to inquire what are the considerations which obstruct the exclusive provision as a war measure of a national wheatmeal loaf of the highest practicable extraction, and whether the objections to its adoption are such as to outweigh the practically unanimous recommendations of medical and scientific experts and the value of the tonnage which could be saved by the use of all imported wheat for human consumption, and to report with the least possible delay."

House of Commons. E. GRAHAM-LITTLE.

THE CHRISTMAS GIFT: RESULT

SIR,—I am grateful to you for your help in the success of the Christmas Gifts fund. I would like to have written a personal letter of thanks to each donor but there have been so many who have very generously contributed that it is beyond my powers. I am greatly indebted to those who have given time and trouble in organising collections or circulating my appeal to others.

The response has been so satisfactory that we have been able to give a Christmas gift to each one of our regular beneficiaries and in addition a special New Year gift to the very poorest. The sincere gratitude and appreciation shown in the letters of thanks proves beyond doubt what pleasure these gifts bring to our people and how greatly they have cheered many whose lives are very sad. It is their thanks which I pass on to you and your readers. I am sure that it will be your wish, as it is mine, that when each Christmas comes in the future the Royal Medical Benevolent Fund will continue this part of its benevolence, which reveals the spirit of brotherhood within the profession.

THOMAS BARLOW,
President, RMBF.

Balliol House, Manorfields, London, S.W.15.

EMERGENCY MEDICAL SERVICE

SIR,—The suggestion made in Dr. Green-Armytage's letter published in your issue of Jan. 3 that doctors employed in the Emergency Medical Service at a part-time salary of £500 a year are not rendering any substantial service in return for their salaries is not supported by the facts. Doctors in the London sectors on a part-time contract with the Ministry put in, on an average, the equivalent of 6 sessions a week during December, 1941, a figure which would enable them to earn just over £500 a year on sessional contracts. But for the financial limit imposed by the sessional form of contract they would earn about one and a half times their present salary. Many of them are engaged almost wholly on E.M.S. work but prefer to take part-time work to enable them to assist in meeting the needs of the normal civilian population.

Nor is it the case that these doctors have failed to reach their hospitals after a blitz. Those who do not live in, or close to, the hospitals to which they are attached are resident in the large centres of population where heavy casualties are likely to occur. Even if some of them could not reach the peripheral hospitals quickly, it would be equally impossible to evacuate patients to those hospitals, and operations which cannot be postponed must be carried out in the central hospital near where these doctors reside.

The recruitment of medical men to the Services is, under the Ministry, the responsibility of the Central Medical War Committee which has, to the end of 1941, met the Service needs to that date, as advised by the recommendations of the Medical Personnel (Priority) Committee. The C.M.W.C. has also met in full the demands of the Services for specialists. Until recently, 41 was the age-limit for recruitment and all medical practitioners are reviewed by the C.M.W.C. as the needs of the Services require. Under the new National Service Act male practitioners up to 51, as well as women doctors up to 30, will be liable to recruitment and will have to be considered in meeting the demands.

The Ministry is satisfied that the part-time practitioners have made a valuable contribution towards the country's needs by responding to all calls made on them.

S. F. WILKINSON,
Director of Public Relations.

Ministry of Health, S.W.1.

THE STICKINESS OF PLATELETS

SIR,—I agree with Dr. Baar (Dec. 20, p. 775) that the disappearance of platelets from drawn blood is due both to their disintegration and to their adhesion to the walls of the glass container. The proportionate manner of their loss depends on the conditions of the experiment. The observations described in my recent paper (*J. Path. Bact.* 1941, **53**, 255) demonstrated that during the relatively short period of 80 minutes by far the greater number of these cells were removed by adhesion to the vessel wall. This is borne out both by the comparatively slight disappearance of platelets from the control vessels whose walls had been lined with 'Vaseline' and by the recognition of these cells, after staining, on the walls of the untreated vessels at the end of the experimental period. Further, calculations of the approximate number of platelets deposited per square millimetre of the glass surface, and of the number that had disappeared from the rotated blood sample, show a satisfactory agreement which would not have been found had disintegration of large numbers of these cells taken place. The observations of Dr. Baar and Miss Székély were made under conditions so unlike mine—their specimens of blood having been greatly diluted and kept for very much longer periods—that differences in the behaviour of the platelets might reasonably be expected and disintegration of a much larger proportion may well have taken place in their experiments.

Farnborough, Kent. HELEN PAYLING WRIGHT.

TWINING MEMORIAL

SIR,—The Faculty of Radiologists proposes to establish a memorial to the late Dr. E. W. Twining of Manchester, and it has been decided that it shall take the form of a medal to be awarded biennially on the results of the examination for the fellowship of the faculty. Dr. Twining was a great teacher and took a keen interest in the training of radiologists and the establishment of a higher qualification for them. It is therefore thought that such an award in his memory would be very appropriate. Contributions, which should not exceed three guineas, should be sent to the hon. treasurer, at 32, Welbeck Street, W.1, and cheques made payable to "The Faculty of Radiologists."

S. COCHRANE SHANKS, President.
M. H. JUPE, Hon. Secretary.
B. W. WINDEYER, Hon. Treasurer.
S. WHATELY DAVIDSON,
E. DUFF GRAY.

Twining Memorial Committee.

VOLPAR PRODUCTS

SIR,—Dr. Jackson in your issue of Dec. 27 supporting 'Volpar' says she has seen no sign of mercurial poisoning from its use. Years ago, when I first founded birth control clinics, neither did some of the then practising medicals see any signs of mercurial poisoning when they advised the use of mercuric chloride as a vaginal douche. It was under the care of her own medical practitioner advising this that a school friend of my own nearly died until I found out what was going on and stopped it. In any clinic with which I am connected I have never permitted the use of a mercury compound, but we hear a good deal of objection to volpar from those attending our clinics after having been dissatisfied with the advice of the Family Planning Association. That volpar is definitely injurious I feel quite certain.

The points raised by Dr. R. L. Brown and Dr. C. J. Gamble, especially "that contraceptive efficiency measured by laboratory methods does not necessarily tally with clinical experience," should be taken to heart by the medicals of the Family Planning Association, for Drs. Brown and Gamble enunciate a very important sociological truth, that volpar "has not yet been shown to be harmless when used regularly over a long period." If even only a small percentage of women suffer from using it, that makes it unsuitable for general clinical recommendation.

As the founder of the Mothers' Clinics I deplore more profoundly than I can express that the schism, the

Family Planning Association, does not follow the fundamental policy of safe C.B.C. clinical work—namely, that (apart from rubber) nothing is advised for use by the clinic patients in the vagina that the practitioner advising it would not himself be willing to masticate and swallow daily for long extended periods. In that way *only* safety lies.

Clinic for Constructive Birth Control, Whitfield Street, W.1. MARIE C. STOPES.

ANÆSTHETIC FLOWMETERS

SIR,—Professor Macintosh's remarks on flowmeters (Jan. 3, p. 27) fail to obscure the main issue of priority raised in my letter (Dec. 20, p. 776). When the Siebe Gorman flowmeter is vertical the bobbin does rotate. Whether rotation per se is absolutely essential for practical purposes may be open to argument. It is significant that at least three well-known American anæsthetic machines are fitted with flowmeters involving the tapered tube principle. In none of these is rotation a feature, yet they are known to be accurate. Whatever investigations Richard Salt may have conducted in 1937, and however generous Mr. A. Charles King may be in the transference of his laurels, the fact remains recorded in the correspondence files of the Rotameter Company that Mr. King first suggested the manufacture of rotameters for anæsthetic purposes in 1932.

Harley Street, W.1. I. W. MAGILL.

"A CONTRAST"

SIR,—It is natural that the Secretary of the Nursing Recruitment Centre should rise to her feet to accuse Dr. Carling of a non sequitur. That doughty warrior Esther Carling would have been disappointed otherwise. All the same, none of us can get away from the fact that a variety of institutions take on "probationers" who are called "nurses," who undergo some kind of a "training" and who are accepted by the public as nurses, and they do prejudice nursing as a career however good the prospects of state registered nurses may be.

In my judgment it is the elect, the nursing *profession*, the *state registered* nurses who should demand an end to this. They know what nursing is and could be. It will mean dilution, it does mean dilution, and the people to control dilution in a profession are the skilled workers with Parliament to hold the ring. Every member of Parliament must have at least two state registered nurses in his constituency. Four hundred or so members of Parliament clamouring to put questions down on the order paper might end for ever scandals such as the *Royal Cornwall Gazette* reports. Incidentally, nurses would have found the way to democratic action, saved their profession and brought us a step nearer to a national nursing service for old and young, rich and poor.

Richmond, Surrey. G. B. CARTER.

DISINFECTANT ON DRAUGHT

SIR,—I have had a rather similar experience (though with a happy ending) to the tragic case reported in your issue of Dec. 27, where phenol was given by a V.A.D. nurse for gastric trouble. Some 20 women donors had given about a pint of blood each for the E.M.S. transfusion service. Two felt faint and a V.A.D. who had had considerable experience of this work in another large centre went to get a standard medicine for fainting. Instead she poured out a dose of diluted "Monsol" for each; this came from large Winchester quart bottles and was used as a hand lotion. One of the women drank half and promptly vomited it, the other drank the lot but suffered no ill effects. The incident was incredibly stupid and the culprit dismissed herself after it though she treated it as a joke at the time.

These incidents show the dangers of allowing shortcuts to a medical qualification of any kind. The background our hospital nurses have saves them from such mistakes. These nurses regard helping in the blood transfusion work as one of the plums of nursing work. They rightly resent the way they are left out of such work in order that volunteers who are untrained by comparison can be kept interested. Until a V.A.D. nurse is as well trained as a hospital nurse she will serve her country best by relieving the more trained nurse of her less interesting tasks.

TRANSFUSION.

Public Health

From the Annual Reports

WILLENHALL

Dr. James Gregory's report of this urban district of 28,610 persons during 1940 shows that the war has so far left its population unaffected. Its birth-rate was 24·9, corrected death-rate 15·37 and infantile mortality 65. Of the 547 births registered in the year only 13 were illegitimate and there was neither stillbirth nor infantile mortality from illegitimate pregnancy. The 45 new cases of tuberculosis gave an incidence-rate of 1·57 and the 27 deaths a mortality-rate of 0·94. Both rates are high as they are usually in Willenhall; but in such a small population annual variations are great. Since 1912 there have been 1634 cases of tuberculosis notified with 850 deaths, a fatality of 50%. "Practically the whole effort made against the disease has been with regard to treatment of established cases. Little or nothing has been done to prevent new cases arising." This statement, made by Dr. Gregory, is too sweeping, but it is true that our efforts in treating established pulmonary tuberculosis have done little to reduce its fatality, and what we have done to prevent the disease has of recent years been disappointing in its results. In the list of deaths cancer stands first with 48 out of 355 deaths from all causes.

A table of refuse collection shows the amount and character of what we usually discard as household rubbish. The collection includes 75 tons of waste paper; 44 tons of tins; 11 tons of iron scrap; 2 tons of lead scrap; 7·5 tons of bottles; and 3·75 tons of sacking.

NOTTINGHAM

Dr. Cyril Banks's report, though short and shorn of the usual tables, contains five suggestions for post-war attention. He thinks we should provide accommodation for children unable to look after themselves when a parent has to go into hospital, and for elderly people who cannot look after themselves and who cannot live alone. His other suggestions are: extended pathological service so that all practitioners on behalf of all persons can obtain all aids to diagnosis and treatment, such as is now available in Kent and in most American cities; extension of district-nursing arrangements, which in effect would be a national domestic nursing service; and coöperation of hospitals, on which Dr. Banks has nothing fresh to say.

Infantile mortality in Nottingham touched the low record for the city of 61. This is interesting, because 1940 was not a year with many low infantile mortality-rates and Nottingham in the past had a persistently high rate. There was some increase in tuberculosis, the number of cases on the register rose from 1191 to 1212 and the mortality from 0·98 to 1·03. The rate is high, for the average for the country is expected to work out at about 0·7. The increase, though disturbing, must not be taken at its face value, for there were circumstances which would raise the recorded rate without any increase in local fatality. Cerebrospinal fever gave 58 cases with 15 deaths, but of the 45 cases admitted to the isolation hospital only 7 died.

Infectious Disease in England and Wales

WEEK ENDED DEC. 27

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 997; whooping-cough, 1124; diphtheria, 845; paratyphoid, 5; typhoid, 14; measles (excluding rubella), 540; pneumonia (primary or influenzal), 751; puerperal pyrexia, 140; cerebrospinal fever, 95; poliomyelitis, 11; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 93; ophthalmia neonatorum, 46. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fevers, 2 (0) from measles, 1 (0) from scarlet fever, 8 (2) from whooping-cough, 32 (0) from diphtheria, 39 (0) from diarrhœa and enteritis under 2 years, and 32 (1) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 7 deaths from diphtheria.

The number of stillbirths notified during the week was 148 (corresponding to a rate of 41 per thousand total births), including 15 in London.

Medical News

Service Awards

The Air Force Cross has been awarded to Acting Wing-Commander Thomas Conchar Macdonald, M.D. GLASG., R.A.F. medical branch.

The *D.S.C.* has been awarded to the late Surgeon Lieutenant William Boyd, M.B. GLASG., R.N., H.M.S. *Imperial*, and to Temp. Surgeon Lieutenant T. S. Einerl, M.B. LPOOL, R.N.V.R., H.M.S. *Afridi*, "for courage, resource, zeal and devotion to duty while serving with the Home Fleet in Norwegian waters and elsewhere in the spring and summer of 1940."

The following have been mentioned in dispatches: Surgeon Lieutenant E. B. McDowall, M.B. CAMB., R.N.V.R.; Temp. Surgeon Lieutenant T. M. Adnams, M.B. EDIN., R.N.V.R.; Temp. Surgeon Lieutenant P. S. Hawkins, M.R.C.S., R.N.V.R.; and Temp. Surgeon Lieutenant R. H. Roberts, M.B. LPOOL, R.N.V.R.

The appointments and awards made in recognition of distinguished services in the Middle East between February and July of last year include the following:—

C.B.E.—Brigadier (temp.) Charles Crawford Jones, M.B. BIRM., late R.A.M.C.; Colonel Johannes Phillip de Villiers, M.D. DUBL., S. African F.; Colonel Neil Hamilton Fairley, O.B.E., M.D. MELB., F.R.C.P., Australian M.F.; Colonel William Wallace Stewart Johnston, D.S.O., M.C., M.D. MELB., Australian M.F.; Colonel Graham Rigby Lynn, D.S.O., M.B. LOND., I.M.S.; Brigadier Kenneth MacCormick, D.S.O., F.R.C.S., K.H.S., N.Z.M.F.; Brigadier (temp.) Alexander Jeremiah Orenstein, C.M.G., M.R.C.P., South African M.F.; and Colonel James Chambers Sproule, O.B.E., L.R.C.P.I., late R.A.M.C.

O.B.E.—Major (temp. Lieut.-Colonel) Edward Rowan Boland, F.R.C.P., R.A.M.C.; Captain (temp. Major) A. G. Fleming, R.A.M.C.; Captain (temp. Major) I. Gordon, R.A.M.C.; Major (temp. Lieut.-Colonel) Robert Richards Leaning, M.R.C.S., R.A.M.C.; Major (acting Lieut.-Colonel) Alfred Pain, M.R.C.S., R.A.M.C.; Colonel (temp.) Cyril Popham, L.R.C.P.E., R.A.M.C.; Lieut.-Colonel Noel Hunter West Saxby, M.B. SYDNEY, Australian M.F.; Major (temp. Lieut.-Colonel) Robert Charles Speirs, M.D. EDIN., E. African A.M.C.; Colonel (temp.) D. Stewart, T.D., R.A.M.C.; and Colonel Evelyn Alex. Sutton, M.C., M.R.C.S., late R.A.M.C.

M.B.E.—Captain (temp. Major) William John Gibson Barrie, M.D. EDIN., R.A.M.C.; Lieutenant C. H. Bone, E. African A.M.C.; Major Wajid Ali Burki, M.D. ST. AND., I.M.S.; Captain Clifford Bayard Drew, M.R.C.S., R.A.M.C.; Captain Edward Leonard Fawssett, M.R.C.S., R.A.M.C.; Lieutenant Martin Edward Meakin Herford, M.B. BRIST., R.A.M.C.; Captain Cuthbert Roy Houghton, M.R.C.S., R.A.M.C.; Captain John Brebner Morrison Milne, M.B. EDIN., R.A.M.C.; Captain Eric Geoffrey Morris, M.B. CAMB., R.A.M.C.; Captain Robert Steel Morton, L.R.C.P.E., R.A.M.C.; Lieut. (temp. Captain) Edward Pim Rigby, M.B. LOND., E. African A.M.C.; and Captain (acting Major) John Woodrow, M.B. CAMB., R.A.M.C.

Army Appointment

Lieut.-General Sir James Hartigan, M.B., has been appointed representative colonel commandant, R.A.M.C., for 1942.

University of London

At recent examinations the following were successful:—

M.D.

Branch I.—(*Medicine.*)—Stella M. Instone, R. D. C. Johnstone, A. A. G. Lewis, C. D. Needham and Alec Sakula.

Branch III (*Psychological Medicine.*)—W. L. Neustatter.

Branch IV (*Midwifery and Diseases of Women*).—Elsie M. Terry.

Branch V (*Hygiene*).—C. N. Faith.

Royal College of Surgeons of England

The following Hunterian and Arris and Gale lectures will be delivered during January and February: Jan. 12, Mr. F. W. Willway, the rôle of surgery in mental disease; Jan. 14, Surgeon Rear-Admiral Cecil P. G. Wakeley, war burns; Jan. 20, Lieut.-Colonel A. E. Hamerton, primary degeneration of the spinal cord in monkeys; Jan. 21 and 22, Mr. W. Turner Warwick, constitution and growth of long bones; Jan. 28, Surgeon Commander E. R. P. Williams, blast effects in warfare; Jan. 30, Mr. Arnold Sorsby, ætiology of phlyctenular ophthalmia; Feb. 3, Mr. J. T. Chesterman, post-lobectomy collapse of the lung; Feb. 5, Mr. N. Asherson, the otogenic cerebellar abscess, with special reference to the posterior fossa cerebrospinal-fluid syndrome and the operative treatment; Feb. 9, Prof. Francis Davies, the conducting system of the vertebrate heart; Feb. 17, Squadron-Leader D. N. Matthews, local chemotherapy in the treatment of wounds and burns; Feb. 18, Dr. D. P. Cuthbertson, aspects of the physiological reaction to injury—the post-shock metabolic response; Feb. 23 and 24, Dr. John Beattie, physical and chemical changes in the blood associated with shock and hæmorrhage; and Feb. 26, Surgeon Rear-Admiral Gordon-Taylor, surgical anatomy of the lower end of the common bile-duct, and the adjacent head of the pancreas. The lectures will be held at the College, at 2.30 P.M.

Society of Apothecaries of London

G. R. Boyes, St. Mary's, has completed the final examination of the society and has been granted its diploma entitling him to practise medicine, surgery and midwifery.

Faculty of Radiologists

The diagnosis section of the faculty will meet at 11 A.M., on Friday, Jan. 16, at 32, Welbeck Street, London, W.1., when Mr. A Dickson Wright will open a discussion on lesions of the intervertebral discs, and Major Hugh Davies will report on a series of head injuries investigated by air encephalography. On the following day at 10.15 A.M., the therapy section will meet to discuss the constitutional effects of radiation, with special reference to volume dose. The openers will be Dr. W. M. Levitt, Prof. W. V. Mayneord, D.SC., Dr. Frank Ellis, and Ralph Phillips.

Royal Society of Medicine

The section of dermatology of this society will meet on Thursday, Jan. 15, at 2 P.M., when clinical cases will be shown. On Jan. 16, at 2.30 P.M., Prof. J. M. Munro Kerr will deliver his presidential address to the section of obstetrics and gynæcology. He will speak on progress in that specialty during the present century. There will be a discussion at the same time, at the section of radiology, on avascular necrosis of bone, which will be opened by Mr. R. Watson-Jones and Dr. J. F. Brailsford. On Jan. 17, at 10.30 A.M., at a joint meeting of the sections of neurology and orthopædics, Dr. J. Purdon Martin and Mr. V. H. Ellis will open a discussion on sciatic pain. Dr. F. A. Elliott and Mr. Joe Pennybacker will also speak.

The paper on the control of louse-borne typhus fever in Great Britain in the light of experience in Russia, Poland, Rumania and China, which was read at the section of epidemiology and state medicine on Nov. 28, will be published in the December issue of the *Proceedings* of the society. A limited number of copies of the sectional proceedings containing the report are available at the editorial office of the society, 1, Wimpole Street, London, W.1 (2*s.* 6*d.* post free).

Distribution of the Wellcome Medical Diary which has been delayed owing to paper restrictions will begin shortly.

Appointments

ATKIN, MINNIE, M.B. LOND., D.P.H.: asst. M.O. (maternity and child welfare) for Sheffield.

BOTTOMLEY, JANET, M.B. LOND., F.R.C.S.: junior H.S. at Chelsea Hospital for Women.

BROWN, J. W. F., M.R.C.S.: temp. asst. M.O.H. for Gloucestershire.

DAVEY, A. C. C., M.B. MANC.: R.S.O. at the Dreadnought Seamen's Hospital, Greenwich.

FORBATH, A., M.D.: asst. school M.O. for Huddersfield.

FRANCIS, J. E., M.D. DURH.: medical registrar at the Royal Northern Hospital, London.

GREIG, M. T., M.B. CAMB.: surgical registrar at the Royal Northern Hospital, London.

GWYNNE-EVANS, ERIC, M.B. LOND: consulting ear, nose and throat surgeon (war deputy) at King Edward Memorial Hospital, Ealing.

SCHOLEFIELD, JOYCE, M.B. LPOOL: asst. M.O. for Burnley.

STRINGER, P. R., M.B. LOND.: R.S.O. at the Hospital for Consumption and Diseases of the Chest, Brompton.

Births, Marriages and Deaths

BIRTHS

HOWKINS.—On Dec. 31, at Marlborough, the wife of Squadron-Leader John Howkins, F.R.C.S., R.A.F.V.R.—a son.

PEARSON.—On Dec. 30, at Pinner Hill, the wife of Dr. J. E. G. Pearson—a son.

MARRIAGES

GORDON—BIGGER.—On Jan. 3, at Walton-on-Thames, Kenneth George Ormond Gordon, L.R.C.P.E., surgeon lieutenant, R.N., to Eileen Patricia Bigger.

WOOD—HART.—On Dec. 18, at North Walsham, Kenneth Duncan Wood M.B., captain, R.A.M.C., to Ann Hart.

DEATHS

JAMISON.—On Jan. 4, at Sea Point, Capetown, Reginald Jamison, B.M. Oxfd, F.R.C.S., aged 63.

MACLEOD.—On Jan. 3, at Par, Cornwall, Elizabeth Macleod, M.D. Edin.

MERRALL.—On Jan. 3, at St. Annes-on-Sea, Harry Merrall, M.B. Manc.

NEWTON.—On Jan. 5, at Pitlochry, Charles Herdman Newton, M.B. Edin., aged 51.

SCOTT.—On Jan. 2, Maitland Scott, M.B. Lond., of Bournemouth, aged 54.

WOOD.—On Dec. 25, at Bexhill-on-Sea, George Edward Cartwright Wood, M.D., B.Sc. Edin., of Overstrand Mansions, Battersea Park.

Notes, Comments and Abstracts

TRANSFUSION SITES

RICHARD E. STRAIN, M.D. MANITOBA, M.C.P.S.
PROFESSOR OF EXPERIMENTAL SURGERY, MIRAJ MEDICAL CENTRE, INDIA

FROM time to time severely shocked patients are met with in whom the usual transfusion sites have been burned or otherwise damaged, or have been rendered unfit for use by repeated needle punctures, hæmatomas, or the unwise use of the knife. At such times one must adopt some other site if the patient is to be saved. Similar difficulties commonly arise when an infant is to be transfused.

The ideal transfusion site should be quickly available, easily entered without pain to the patient, constant in its anatomical location, not liable to collapse when shock is present or to bleed after the transfusion is finished, and should be in an area not too prone to damage and resistant to infection. The veins of the antecubital fossa are rightly the most popular. Failing these I use the veins of the forearm or on the dorsum of the hand; about the wrist the radial cephalic vein may be useful. Unfortunately these veins are often difficult to find and may be invisible in cases of collapse. The superficial veins of the leg are particularly useful in infants. The great saphenous vein just in front of the medial malleolus and the small saphenous vein just behind the external malleolus are present in almost everyone. Occasionally the dorsal venous arch of the foot is of value. The external jugular, frontal and superficial temporal veins are sometimes used for transfusions, but I never use them now. I have found the external jugular extremely difficult to enter as a rule. The frontal vein has direct entrance to veins leading to the cavernous sinus and in my experience has never been prominent. The superficial temporal vein is usually covered by hair; it may occasionally be useful in infants.

Few deep veins are available for transfusion. The femoral vein can easily be found medial to the femoral arterial pulsation, but this guide may be lacking in a badly shocked patient. The internal jugular vein is easier to enter than the external, but extravasation into the tissues may lead to respiratory distress. I have never used it for transfusion though I have often used it for obtaining specimens of blood from infants. The head is turned to the side so that the sternomastoid is prominent and is held slightly down over the edge of the table. The needle is inserted at the mid-point of the sternomastoid and just posterior to it, with the point directed towards the suprasternal notch; the needle enters the vein without difficulty. Another deep venous space used for transfusion in infants is the superior longitudinal sinus. This lies very slightly to the right of the midline and may be easily entered through the anterior fontanelle. I have used this route many times but always with reluctance.

In the last year Henning[1] in Germany and more recently Tocantins and O'Neill[2] of Philadelphia have been giving infusions into the medullary cavity of the sternum, but I have not yet had experience of this apparently highly successful method.

Intraperitoneal infusion is useful for plasma or saline, but red cells are not absorbed by this route. A blunt needle is advisable to prevent perforation of the intestine. —a dull-pointed lumbar-puncture needle of 18 or 20 gauge is suitable. The site usually chosen is in the midline just below the umbilicus, this being relatively avascular. In very young infants it is best to insert the needle at the junction of the middle and outer two-thirds of a line joining the umbilicus and the anterior superior iliac spine, for occasionally the hypogastric artery remains patent for several days after birth.[3]

USE OF THE CORPUS CAVERNOSUM

In 1937, when I was in charge of surgery at the Hunchow General Hospital, I was called to see a severely shocked patient in whom vain attempts had been made to find the veins of the arms by cutting down on them, until these sites seemed so mutilated as to be useless. No veins were visible on the legs and no arterial pulsation could be felt despite the administration of adrenaline. The man had an exceptionally large penis, and I decided to give blood through the corpus cavernosum. A needle attached to a syringe was introduced from the dorsum just lateral to the dorsal vein, and in such a direction as to avoid the urethra if one went too deep. Suction produced no blood, but I felt sure that the needle was in the corpus cavernosum, so blood was forced in with the syringe until over 500 c.cm. had been given with only slight visible swelling of the penis. The superficial vein became prominent during the procedure, and this vein also might be a possible transfusion site. The patient recovered and no ill effects of the transfusion were noted.

Since then I have often used the corpus cavernosum for transfusion when the superficial veins were collapsed and a rapid increase in blood-volume was required. Usually no blood can be obtained when the needle is introduced and aspiration attempted. This has not proved any real difficulty because if one is familiar with the anatomy of the penis it is difficult to miss the corpus cavernosum. Citrated blood is used. This is introduced by syringe because gravity methods are too slow in the urgent cases where this route is used. I have never given glucose or saline by this method and there is no doubt a risk of chronic cavernositis if irritative solutions are used.

In making the puncture the needle may be inserted into the corpus from the lateral side or it may enter from the dorsum just to one side of the dorsal vein. The dorsal vein between and above the corpora and the urethra between and below them are the two structures one should guard against injurying. I have not seen any accident or ill effects from the use of this route. The fascia of the penis (Buck's fascia) ensures that very little swelling will take place, and as the pressure increases the transfused blood passes rapidly from the corpus cavernosum into the deep and superficial dorsal veins. In most instances the superficial dorsal vein becomes distended during the infusion. This vein lies outside the fascia of the penis and empties into the saphenous vein, while the deep dorsal vein lies beneath the fascia, and empties into the pudendal plexus.

SUMMARY

The corpus cavernosum of the penis is a quickly available transfusion site of constant anatomical position which withstands repeated punctures without hæmatoma formation and does not collapse during shock. It absorbs blood rapidly, is in a protected area where injury is infrequent, does not bleed after transfusion, and no ill effects have been noted from its use.

This route is not recommended for other than blood or blood-plasma infusions.

1. Henning, N. *Deutsch. med. Wschr.* 1940, **66**, 737.
2. Tocantins, L. M. and O'Neill, J. F. *Surg. Gynec. Obstet.* 1941, **73**, 281.
3. Ravenel, S. F. *J. Amer. med. Ass.* 1933, **100**, 473.

MELANOMA OF THE TONSIL

MELANOMATA do arise in sites where melanin-containing cells are not normally found but they are rare, and in reporting a case of melanoma of the tonsil, J. A. Del Sel and M. Polak (*Rev. Med. Cien. afines*, 1941, 3, 533) say that only two others are on record. A man of 57 complained that for 3 months he had noticed discomfort, not amounting to pain, in the right side of the pharynx. The right tonsil was very dark in colour but otherwise appeared normal. A thickening could be felt at the level of the angle of the jaws, but no individual glands were palpable. A portion of the tonsil was removed for histological examination, which showed that the tissue was infiltrated with melanotic cells. The patient was treated by deep X-ray therapy, and after fifteen applications all sign of the tumour had vanished; but 2 months later the mass in the neck had reappeared and was larger than at the first examination, and the tonsil had resumed its former appearance. Further X-ray treatment was ordered as a forlorn hope.

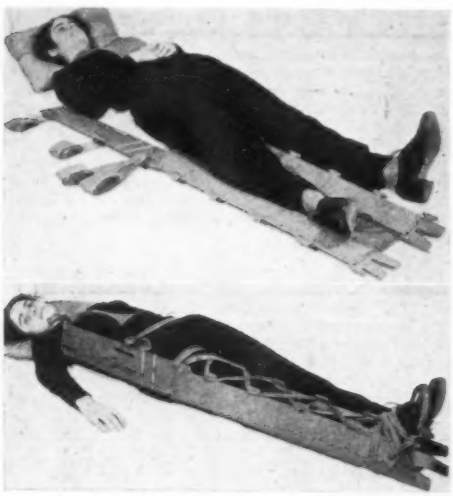
Corrigendum.—The blood-pressure of Dr. Butler's patient (*Lancet*, Jan. 3, p. 26) at his preliminary overhaul was 140/83 mm. Hg.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

THE HAYES SPLINT

Dr. J. A. KENNEDY YOUNG writes:

The first-aid methods taught by the recognised manuals for fractures or other severe injuries of the lower limbs requiring splinting leave much to be desired. The application of the long external splint with its eight bandages, or the Thomas splint, is much too complicated for comparative novices. Mere tying of the limbs together, which I have seen advocated for transference of the patient to a stretcher, allows too much movement of the injured limb when it is desirable to have the joints above and below the broken bone immobilised. I have



The Hayes splint. Above, ready for application; below, applied.

been interested for some time in perfecting a splint, invented by a keen first-aid worker in the Manchester district, which fulfils the requirements for support of the lower limb. It is applicable to any injury of either lower limb; adequate fixed padding, and long windows in the plywood panels opposite bony prominences, ensure comfort and lightness; it can be applied by feel only in darkness and by one operator if necessary; its application is rapid and simple, and can be taught to a class of first-aid workers in half an hour.

The splint (see figure) is made of two panels of plywood (the longer panel 54 in. and the shorter 35 in. in length), which, when in position, are somewhat flexible laterally but rigid in an anteroposterior direction. The lateral flexibility permits some degree of adaptation to the curves of the body. Under the padding the panels have large windows and are of convenient length (arrived at by a large number of experiments) for use on either a tall or a short person. The panels are joined together by drill, the padding being held over both sides of the wood by drill envelopes. The posterior cloth joining the panels is in the form of a sleeve into which extra padding may be inserted if desired. The drill, being attached by four cords through eyelets, can be stripped for washing in a few minutes. Wooden lugs project from each panel on which the strong bands are laced. The long panel is held to the trunk at the pelvis and the chest by ties which are in long slots, allowing adjustment according to the height of the patient.

The splint is laid out beside the injured limb with the four bands ready for use as shown in the upper photograph, the short panel being nearest the leg. The operator kneels at the feet, facing the patient. Grasping the foot of the injured leg, he applies steady traction and gently raises the limb from the ground. This position is retained with the external hand and the splint pulled under the leg, the top of the connecting cloth being as near the fork as possible; the leg is then lowered and the panels are turned upright and held firmly between the operator's knees. The bands to the lugs are laced criss-cross as illustrated. It is desirable to press the panels firmly together with one hand while lacing as far as the lugs nearest to the dorsum of the foot. The bands are crossed over the dorsum of the foot and carried through both V-shaped slots at the ends of the panels. This applies a certain amount of traction to the leg and to some extent overcomes muscular spasm, a fruitful cause of pain. The bands are then taken round both feet and tied.

I have used the Hayes splint in two fractured femora and one compound fracture of the tibia, with the following advantages. The splint was ready for use, and no delay was caused by fixing padding or bandages. With the splint gripped by the knees no movement of the limb was necessary while making the splint firm. In the compound fracture of the tibia I was able to see the wound and apply a sterile dressing after the splint was in position; in this case the criss-cross bands would have pressed on the injury, so the lugs nearest the wound were missed out in the lacing. The rigidity imparted to the limb gave a greater degree of comfort than any first-aid splint I have used. The time taken in applying the splint was reduced to seven minutes, and the exposure of these shocked cases was thus considerably lessened.

The Hayes splint is in my opinion an improvement on any other form of first-aid appliance for severe injuries of the lower limbs. As no great degree of adroitness is required in its application it is ideal for war and air-raid casualties and for accidents in mines and works where space may be very restricted. It is manufactured by Wayden Ltd., Red Bank Works, Radcliffe, Lancashire.

J. D. would be glad if any reader who has used autogenous vaccine for prevention of recurrent erysipelas would give him the benefit of his experience with results.

PICTORIAL HYGIENE IN THE ARMY

The War Office, not having read our peripatetic's account of how to keep the soldier clean (*Lancet*, Jan. 3, p. 23), have had to devise other—and more humane—methods of keeping him up to the mark. Clear and clever posters have been designed, and will be hung where they catch the military eye and prod the military conscience. Our small reproductions of six of them do scant justice to skilful use of text and colour. There is every reason to hope that education in hygiene so ably presented will have its reward in a rising standard of health and personal pride among the men.

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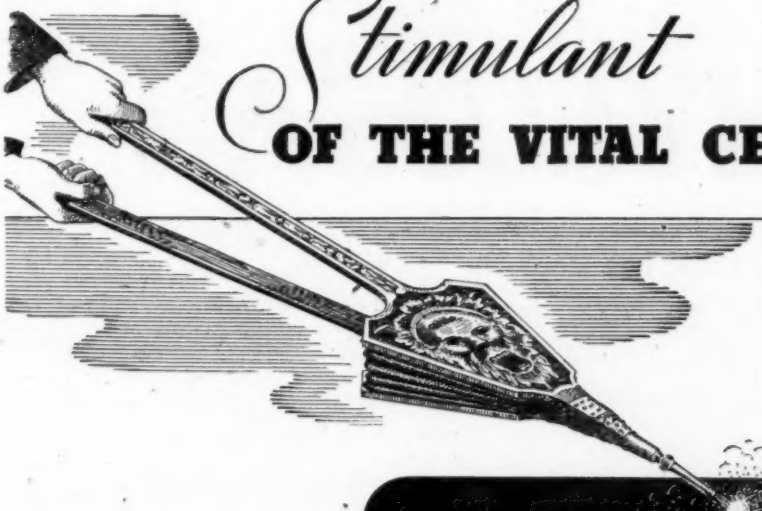

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Lancet, 1934, 2, 780.

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(The Prescriber, Jan. 1958)

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12 NOON to 1 P.M.—Lunch.
1 P.M. to 2 P.M.—Clinical Lectures and Demonstrations.
2 P.M. to 4 P.M.—Practical Classes.
4 P.M. to 5 P.M.—Questions and Discussions.

MONDAY, 2ND FEBRUARY ..	General Principles of Fracture Treatment.
TUESDAY, 3RD FEBRUARY ..	Injuries of the Upper Limb.
WEDNESDAY, 4TH FEBRUARY ..	Injuries of the Lower Limb.
THURSDAY, 5TH FEBRUARY ..	Injuries of the Spine, Pelvis, and Hip Joint.
FRIDAY, 6TH FEBRUARY ..	Compound and Infected Fractures. Amputations.

The Course will be limited to a maximum of 40 students, and applications for admission should be submitted to the DEAN, British Postgraduate Medical School, Ducane-road, W.12. The Course will only be held if a minimum of 15 students apply.

The fee for the Course will be five guineas, but a limited number of Officers of the Armed Forces will be admitted free, on the receipt of a leave certificate.

BRITISH POSTGRADUATE MEDICAL SCHOOL
(UNIVERSITY OF LONDON)

WAR MEDICINE—19th to 23rd January, 1942

Monday, 19th Jan.	10 A.M.	Effort Syndrome	Dr. P. H. Wood, M.D., F.R.C.P.
	11.30 A.M.	The Prevention in Barracks and the Field of Certain Wartime Diseases of Special Military Importance.	Lieut.-Col. C. S. Ryles, O.B.E., R.A.M.C.
	1.30 P.M.	Treatment of Gas Casualties.	Prof. J. Nixon, C.M.G., M.D., F.R.C.P.
	3 P.M.	Prescribing in Wartime ..	Dr. P. Hamill, F.R.C.P.
Tuesday, 20th Jan.	10 A.M.	War Neuroses	Col. J. R. Rees, M.D., M.R.C.P.
	11.30 A.M.	Tuberculosis in Wartime and Industry.	Dr. A. J. Morland, M.R.C.S., L.R.C.P., M.B., B.S.
	1.30 P.M.	The Prevention in Barracks of Certain Wartime Diseases.	Lieut.-Col. C. S. Ryles, O.B.E., R.A.M.C.
	3 P.M.	Effects of Blast	Dr. S. Zuckerman, M.A., D.Sc.
Wednesday, 21st Jan.	10 A.M.	Skin Diseases in War ..	Dr. R. T. Brain, M.D., F.R.C.P.
	11.30 A.M.	The Pathology of War Gas Poisoning.	Prof. G. R. Cameron, D.Sc.
	1.30 P.M.	War Neuroses (*contd.*) ..	Col. J. R. Rees, M.D., M.R.C.P.
	3 P.M.	Dyspepsia in War	Dr. C. E. Newman, F.R.C.P., and Mr. R. T. Payne, M.S., F.R.C.S.
Thursday, 22nd Jan.	10 A.M.	T.N.T. Poisoning and War Hazards of Industry.	Dr. Donald Hunter, M.D., F.R.G.P.
	11.30 A.M.	Protective Inoculation with Special Reference to Tetanus.	Dr. P. Hartley, M.D., F.R.C.P.
	1.30 P.M.	Medical Aspects of Head Injuries.	Major W. R. Russell, M.D., F.R.C.P.
	3 P.M.	Food Poisoning	Prof. J. H. Dible, F.R.C.P.
Friday, 23rd Jan.	10 A.M.	Crush Injuries	Dr. E. G. Bywaters, M.R.C.P.
	11.30 A.M.	Sulphonamide Drugs in War.	Col. L. E. H. Whitby, C.V.O., M.D., F.R.C.P.
	1.30 P.M.	Salt and Water	Dr. R. A. McCance, M.D., F.R.C.P.
	2.30 P.M.	Practical Management of Wound Shock.	Dr. J. McMichael, M.D., F.R.C.P., F.R.S.E.

The fee for the Course is one guinea. Officers of the Armed Forces wishing to attend these lectures without payment of the fee should apply through their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, London, W.12.

Further War Surgery Courses will commence as follows:—
TREATMENT OF FRACTURES .. MONDAY, 2ND FEBRUARY, 1942.
WAR SURGERY OF THE CHEST .. MONDAY, 16TH FEBRUARY, 1942.

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The following appointments as Examining Surgeon under the Factories Act, 1937, are vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, 28, Broadway, London, S.W.1.

District	*County*	*Latest date for receipt of application*
BURNHAM-ON-CROUCH	ESSEX ..	20th January, 1942
ST. NEOTS	HUNTINGDON	20th January, 1942
THORNHILL	DUMFRIES ..	20th January, 1942

King Edward Memorial Hospital,

Mattock-lane, Ealing, W.13.

Applications are invited from registered medical practitioners, Male or Female, for the appointment of CASUALTY OFFICER AND DEPUTY RESIDENT MEDICAL OFFICER (B2), vacant 1st February, 1942, including R practitioners who now hold A posts. Six months' appointment. Salary at the rate of £225 per annum, with four residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of two recent testimonials, should be sent to the undersigned immediately.

R. A. MICKELWRIGHT, House Governor.

King Edward Memorial Hospital,

Mattock-lane, Ealing, W.13.

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1), vacant 1st February, 1942. Applicants should have held previous house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £275 per annum, with four residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of two recent testimonials, should be sent to the undersigned immediately.

R. A. MICKELWRIGHT, House Governor.

The South London Hospital for Women,

Clapham Common, S.W.4.

Applications are invited from medical Women for the following appointments: HOUSE PHYSICIAN (A) and HOUSE SURGEON (A), for a period of six months from 1st March. Salary in both cases at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, and accompanied by copies of three recent testimonials, must reach the SECRETARY at the Hospital by 14th February.

Metropolitan Hospital, London, E.8.

Applications are invited from registered medical practitioners (Male) for the appointment of RESIDENT HOUSE PHYSICIAN (A), to become vacant on 1st February, 1942, including R practitioners within three months of qualification. The appointment is for a period of six months. Salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

FRANK JENNINGS, House Governor and Secretary.

St. John's Hospital, Lewisham, S.E.13.

Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE SURGEON (A), to become vacant on 1st February, 1942, including R practitioners within three months of qualification when appointment will be for a period of six months; otherwise it will be for a period of three months. Salary £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent as soon as possible to the undersigned.

J. C. GILBERT, Secretary-Superintendent.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN AND HOUSE SURGEON (A) on 1st February, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 13th January, 1942.

London Jewish Hospital,

Stepney Green, E.1. (M.S.—Sector II.)

Applications are invited from medical practitioners, Male or Female, for the appointment of RESIDENT HOUSE OFFICER (combined House Physician, House Surgeon, and Casualty Officer's duties) (A), to become vacant on 1st February, 1942, for a period of six months, including R practitioners within three months of qualification. Salary is at the rate of £100 per annum, plus a proportion of the grant received in connexion with the M.S., with full resident emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, to be sent to the SECRETARY immediately.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited from registered medical practitioners for the whole-time appointment of OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR (B1). Applicants must not be more than ten years qualified. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £350 per annum.

Applications, stating age, and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before the 7th February, 1942. RICHARD T. BARTLEY, Secretary.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply for the appointment of RESIDENT MEDICAL OFFICER (B1) at THREE COUNTIES HOSPITAL, Arlesey, Bedfordshire. Applicants must not have been qualified for more than ten years.

Applications, stating age, and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before 20th January. The successful applicant will be required to take up the post at once. The salary, which is paid by the E.M.S., is £350 per annum. The appointment will be for six months in the first place. RICHARD T. BARTLEY, Secretary.

The Salvation Army,

THE MOTHERS' HOSPITAL,
Lower Clapton-road, Clapton, E.5.

Applications are invited from medical Women for the post of JUNIOR RESIDENT MEDICAL OFFICER (A), vacant 1st March, 1942. Salary £80 per annum, with board, residence, and laundry. The appointment is for six months.

Applications, with testimonials, to be sent to the Superintendent not later than 27th January, 1942.

FRED HAMMOND, Superintendent.

Resident Obstetric House Surgeon

(B2) required by MIDDLESEX COUNTY COUNCIL for NORTH MIDDLESEX COUNTY HOSPITAL, Edmonton, N.18. Applicants must be registered medical practitioners (including R practitioners now holding A posts) who have held resident appointments in general hospitals. Salary £120 per annum. Board, lodging, and laundry. Appointment is for six months, subject to medical examination and one month's notice. Whole-time duties such as Council may require, under direction of Medical Superintendent. The Hospital has a large obstetric and gynæcological department, and is approved for R.C.O.G. purposes. Post vacant mid-January.

Applications, stating age, nationality, qualifications with dates, and experience, to the undersigned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 21st January, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Middlesex Guildhall, Westminster, S.W.1.

Queen Mary's Hospital for the East END, Stratford, E.15.

Applications are invited from fully qualified and registered medical Men, including R practitioners within three months of qualification, for the following post: HOUSE SURGEON (A), £200 per annum. The appointment will be for six months, commencing the 1st of February, 1942.

Candidates, who must be single, should send applications, together with copies of testimonials, to the undersigned forthwith. Captain BERNARD T. HEMPEL, Chairman.

Middlesex County Council.

Additional PSYCHIATRIST (Temporary and unestablished) required in Public Health Department to assist the Psychiatrist to the Education Committee. Registered medical practitioner with special experience in psychiatry. Whole-time duties under County Medical Officer include medical and psychological examination of boys and girls in Remand Homes, and such other medical work as directed. Salary £600 to £750 per annum, according to experience, with out-of-pocket travelling expenses; one month's notice on either side.

Applications (forms not provided), stating age, qualifications, and experience, with copies of up to three recent testimonials, to the undersigned by 24th January. State relationship to any member or officer of the Council. Endorse envelope "Psychiatrist." No canvassing.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Middlesex Guildhall, Westminster, S.W.1.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for WEST MIDDLESEX COUNTY HOSPITAL, Isleworth, Middlesex. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had special surgical experience. Post now vacant. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Applications, stating age, nationality, qualifications with dates, and experience, to the undersigned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 17th January, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Guildhall, Westminster, S.W.1.

Royal National Orthopædic Hospital, BROCKLEY HILL, STANMORE, MIDDLESEX.

Applications are invited from registered medical practitioners (including R practitioners holding A posts) for the appointment of RESIDENT HOUSE SURGEON (B2). There are two vacancies, one on 1st February and one on 1st March. The appointments are for six months. Salary £200 per annum, with board, quarters, laundry, &c.

Applications, stating age, nationality, qualifications, and previous experience, with copies of testimonials, to be sent to the SECRETARY, Royal National Orthopædic Hospital, 234, Great Portland-street, W.1, not later than Wednesday, 21st January.

Borough of Ilford.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from legally qualified medical practitioners for the above whole-time appointment at a salary of £700 per annum (plus 10 per cent. bonus on the first £450 of such salary), for duties in connexion with Maternity and Child Welfare, Isolation Hospital, School Medical Service, Civil Defence, and General Public Health work in the absence of the holder of the appointment on military service.

The above appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the selected applicant will be required to pass a medical examination by and to the satisfaction of the Medical Officer of Health. The appointment will also be subject to one month's notice on either side.

Applications on the prescribed form, obtainable from my office, accompanied by copies of three recent testimonials, must be received by me not later than Saturday, the 17th January, 1942.

Canvassing, directly or indirectly, will be a disqualification.

CHARLES N. ROBERTS, Town Clerk.
Town Hall, Ilford, 30th December, 1941.

Hertfordshire County Council.

HAYMEADS HOSPITAL, BISHOP'S STORTFORD.

Applications are invited from registered medical practitioners (British-born Males), including R practitioners within three months of qualification, for the appointment of HOUSE PHYSICIAN (A post, general duties) at the above Hospital. The appointment is for six months. Salary £120 per annum, with full residential emoluments.

Applications, stating age, and giving full particulars of training and clinical experience, and accompanied by a testimonial from the Dean of the Medical School, should be addressed to the Medical Superintendent, Haymeads Hospital, Bishop's Stortford, Herts.

P. ELTON LONGMORE, Clerk of the County Council.
County Hall, Hertford.

Tilbury Hospital, Tilbury, Essex.

(SEAMEN'S HOSPITAL SOCIETY.) (116 Beds.)

Applications are invited from British Male registered practitioners for the appointment of HOUSE OFFICER (A), falling vacant on 1st February, 1942, including R practitioners within three months of qualification when appointment will be for six months. Salary at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and testimonials, to be sent to the undersigned.

F. A. LYON, Secretary.
Seamen's Hospital Society, Greenwich, S.E.10,
1st January, 1942.

Warwickshire County Council.

WARWICK HOSPITAL.

Applications are invited from registered medical practitioners for the appointment of SURGICAL REGISTRAR (B1) at the above Hospital which is included in the Medical Service scheme.

Applicants should have held house appointments and should be a Fellow of one of the Royal Colleges of Surgeons. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Salary £500 per annum, together with the usual residential emoluments. If accommodation is not provided at the Hospital a non-resident allowance at the rate of £100 per annum will be made.

Applications should be made on forms which may be obtained from the Public Assistance Officer, Shire Hall, Warwick, and should be returned to him on completion not later than Wednesday, the 21st January, 1942.

L. EDGAR STEPHENS, Clerk of the Council.
Shire Hall, Warwick, 5th January, 1942.

Northampton Education Committee.

Applications are invited for the appointment of a fully qualified dental surgeon as ASSISTANT SCHOOL DENTIST. Salary £500 per annum, plus war bonus (at present six per cent. on first £300 and three per cent. on remainder). The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937.

Further particulars and form of application may be obtained by forwarding a stamped addressed envelope to the undersigned, by whom applications must be received not later than 24th January, 1942. H. C. PERRIN, Secretary for Education.
Education Office, "Springfield," Cliftonville, Northampton.

Northampton Education Committee.

Applications are invited from qualified and registered medical practitioners, preferably from those holding a Diploma in Public Health, for appointment as Temporary ASSISTANT SCHOOL MEDICAL OFFICER. Salary will be at the rate of £500 to £600 per annum, the commencing salary being fixed in accordance with experience. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937.

A form of application and particulars of the appointment may be obtained from the undersigned, by whom completed applications must be received not later than 24th January, 1942.

H. C. PERRIN, Secretary for Education.
Education Office, "Springfield," Cliftonville, Northampton.

Llanelly and District General Hospital.

Applications are invited from registered medical practitioners (Male or Female) for appointment as JUNIOR HOUSE SURGEON (A). The post will become vacant on 23rd January, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise may be extended. The salary is at the rate of £175 per annum, with the usual residential emoluments.

Applications, stating age, qualifications, and two recent testimonials, to be sent to the undersigned.

T. E. PIPE, Secretary-Superintendent.

Herefordshire General Hospital, HEREFORD. (210 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following appointments:—

(*a*) HOUSE PHYSICIAN (A) (Male).
(*b*) JUNIOR HOUSE SURGEON, including House Surgeon to Ear, Nose, and Throat Department (A) (Male or Female).

The appointments will be limited to six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned. T. W. UPTON, Secretary.

East Suffolk and Ipswich Hospital.

(407 Beds—8 Residents.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of HOUSE SURGEON (A). The appointment is for six months from 1st February. The salary at the rate of £144 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to the undersigned.

The Hospital, Ipswich. ARTHUR GRIFFITHS, Secretary.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

Montagu Hospital, Mexborough.

(120 Beds—3 Residents.)

Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON (A) (Male), to become vacant at the beginning of February, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise it will be subject to renewal. This post offers excellent opportunity for experience in all branches of surgery. Salary £200 per annum, with usual residential emoluments.

Applications, stating age, nationality, qualifications, and experience, accompanied with copy testimonials, to be sent to the undersigned immediately.

A. LAYCOCK, Secretary-Superintendent.

Montagu Hospital, Mexborough.

Applications are invited for the combined post of RESIDENT HOUSE PHYSICIAN AND OBSTETRIC OFFICER (A post) (Lady). Commencing salary £150 per annum, with the usual residential emoluments. The appointment is for six months and is renewable.

Applications, stating age, nationality, qualifications, and experience, accompanied with copy testimonials, to be sent to the undersigned immediately.

A. LAYCOCK, Secretary-Superintendent.

Bradfield Hospital, Cullompton.

(90 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1) at the above Hospital, which is an annexe of the Royal Devon and Exeter Hospital, Exeter (total 600 Beds), and is used for semi-convalescent male patients—usually military. The post is suitable for a practitioner unfit for service under the National Service Acts. Salary is at the rate of £200 per annum, with full residential emoluments. Accommodation might be available for wife, but no children, at terms to be arranged. Suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be sent to the undersigned as soon as possible.

L. PARKHOUSE, Secretary and Manager.

Royal Devon and Exeter Hospital, Exeter.

North Riding of Yorkshire County COUNCIL.

NORTHALLERTON HOSPITAL. (640 Beds.)

Applications are invited from registered medical practitioners for the post of RESIDENT SURGICAL OFFICER (B1) at the above-named Hospital. The appointment will be terminable by one month's notice on either side. Salary £350 per annum, with full residential emoluments. Suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, stating age, nationality, qualifications, date when at liberty, recent experience of surgical work, and accompanied by copies of not less than two recent testimonials, should be sent as soon as possible to the undersigned.

H. G. THORNLEY, Clerk of the County Council.

County Hall, Northallerton, Yorks, 5th January, 1942.

Cumberland Infirmary.

(200 Beds.)

HOUSE SURGEON (A) to the EYE and E.N.T. DEPARTMENTS urgently required to fill a vacancy caused by the calling up of the present holder. The appointment is tenable until the 30th March, 1942; if R practitioner he may be reappointed for a further period of six months. Salary is at the rate of £160 per annum, with board, &c.

Applications from registered medical practitioners, including R practitioners within three months of qualification, should be sent immediately, and in any case not later than the 16th January, to the SECRETARY-SUPERINTENDENT, together with any available testimonials.

Carlisle, 30th December, 1941.

The Royal Hospital, Wolverhampton.

(Incorporated under Royal Charter.) (310 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following post: HOUSE SURGEON, FRACTURE AND ORTHOPÆDIC DEPARTMENT (A). Duties to commence immediately. Salary at the rate of £100 per annum, with full residential emoluments. The appointment is for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

W. H. HARPER, House Governor.

Northampton General Hospital.

(405 Beds.)

Applications are invited immediately from registered medical practitioners, including R practitioners within three months of qualification when appointment will be for a period of six months, for the appointments of:—

HOUSE SURGEON (A) This post provides good experience in fractures.

HOUSE SURGEON (A) to the OBSTETRICAL AND GYNÆCOLOGICAL DEPARTMENT.

Salary at the rate of £150 per annum, with board, residence and laundry.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

GORDON S. STURTRIDGE, M.B., B.S., Superintendent.

20th December, 1941.

Kent and Sussex Hospital, ROYAL TUNBRIDGE WELLS.

APPOINTMENT OF EAR, NOSE AND THROAT HOUSE SURGEON AND RESIDENT ANÆSTHETIST (B2).

Applications are invited from registered medical practitioners (Male) for the above appointment, to become vacant January 25th, 1942, including R practitioners who now hold A posts, when the appointment will be limited to six months. The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

TOM B. HARRISON, Superintendent-Secretary.

20th December, 1941.

Kent and Sussex Hospital, TUNBRIDGE WELLS.

Applications are invited from registered medical practitioners (Male) for the appointment of Two HOUSE SURGEONS (B2), to become vacant 1st and 4th February, 1942, including R practitioners who hold A posts, when appointments will be limited to six months. The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality and present post, accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

TOM B. HARRISON, Superintendent-Secretary.

3rd January, 1942.

Royal United Hospital, Bath

Applications are invited from registered Male medical practitioners for the following resident appointment which becomes vacant on 1st February, 1942: HOUSE SURGEON (A) (Gynæcology, Obstetrics, and Anæsthetics). Salary at the rate of £150 per annum, with board, residence, and laundry. R practitioners within three months of qualification may apply when appointment will be for six months.

Applications, stating age, qualifications, experience, together with a copy of three testimonials, to be addressed to the undersigned immediately.

J. LAWRENCE MEARS, Secretary-Superintendent.

6th January, 1942.

Borough of Reigate.

APPOINTMENT OF ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (TEMPORARY).

Applications are invited from registered medical practitioners for the temporary whole-time appointment of Assistant Medical Officer of Health and Assistant School Medical Officer.

The person appointed will work under the direction of the Medical Officer of Health and will undertake duties in the Public Health and School Medical Departments, together with such other duties as may from time to time be prescribed. Preference will be given to applicants holding a registrable degree or diploma in public health and having previous experience in the duties of the office.

The salary will be at the rate of £600 per annum, plus cost-of-living bonus (at present £24 per annum). Reasonable out-of-pocket expenses for travelling, &c., will be paid by the Council.

The appointment will be subject to two months' notice on either side and may be subject also to the provisions of the Local Government Superannuation Act, 1937, for which purpose the successful candidate will be required to pass a medical examination.

Forms of application and further particulars of the appointment may be obtained from the Medical Officer of Health, Public Health Department, Town Hall, Reigate. The completed forms, together with copies of not more than three recent testimonials, should reach the undersigned not later than NOON on Saturday, 17th January, 1942.

HEBER DAVIES, Town Clerk.

Town Hall, Reigate, 24th December, 1941.

Royal South Hants and Southampton

HOSPITAL, SOUTHAMPTON. (255 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), to become vacant on 1st February, 1942, including R practitioners within three months of qualification. The appointment will be for a period of six months. The salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

E. L. WIBOMAN, House Governor.

County Borough of Brighton.

JUNIOR RESIDENT MEDICAL OFFICER (B2) AT INFECTIOUS DISEASE HOSPITAL AND SANATORIUM.

Applications are invited for the above appointment from registered medical practitioners (Male or Female). In the case of male applicants this includes R practitioners who now hold A posts when appointment will be limited to six months. Salary £250 per annum, with board and lodging. The appointment affords opportunities for experience in all branches of the work of a Health Department, including Civil Defence duties.

Particulars and forms of application can be obtained from the undersigned and must be returned to my office not later than Monday, 19th January, 1942.

RUTHERFORD CRAMB, Medical Officer of Health.

Royal York Buildings, Brighton, 1, 29th December, 1941.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners (Male), including R practitioners within three months of qualification, for the following appointments:—

HOUSE SURGEON (A).
CASUALTY HOUSE SURGEON (A).

Required immediately. The appointments are for six months. Salary in each case at the rate of £175 per annum, with residence, board, and laundry. This large industrial area offers excellent opportunities for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent to the undersigned immediately.

R. LANCASTER, Secretary-Superintendent.

Berkshire County Council.

TEMPORARY ASSISTANT MEDICAL OFFICER FOR MATERNITY AND CHILD WELFARE (WOMAN).

Applications are invited from duly qualified medical Women who must have had at least three years' experience since qualification. Candidates should be experienced in antenatal work, midwifery, and children's diseases. The salary will be at the rate of £600 per annum. The appointment will be subject to one calendar month's notice on either side.

Forms of application may be obtained from the undersigned and should be returned by first post on 19th January, 1942.

H. J. C. NEOBARD, Clerk of the County Council.

Shire Hall, Reading.

Liverpool and District Hospital for

DISEASES OF THE HEART,
34, Oxford-street, LIVERPOOL, 7.

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, when appointment will be for a period of six months, for the appointment of a HOUSE PHYSICIAN (A). To commence immediately. Salary is at the rate of £100 per annum, with full residential emoluments. Facilities for M.D. thesis.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

Miss J. LEWIS, Secretary.

The Board of Control (Lunacy and

MENTAL DEFICIENCY) invite applications for the following post at RAMPTON STATE INSTITUTION FOR MENTAL DEFECTIVES, near Retford, Notts:—

DEPUTY MEDICAL SUPERINTENDENT (Male or Female). Salary £850, rising by five annual increments to £1000.

Emoluments are, for a man, (*a*) a house rent free or, alternatively, (*b*) free furnished single quarters and laundry, with board and service provided on payment of actual cost; for a woman, as at (*b*).

Candidates must be registered medical practitioners (Male or Female) and must conform to the Civil Service nationality rule. Men may be unmarried, married, or widowers, and, if unmarried, must be prepared to live in the Institution. Women must be unmarried or widows, and must resign the appointment on marriage. The post is pensionable under the Civil Service Superannuation Acts.

A form of application, with further particulars, can be obtained from the SECRETARY, Board of Control, Clifton Hotel, St. Annes-on-Sea, Lancashire, and must be completed and returned to him not later than 31st January, 1942.

City of Plymouth.

THE CITY ISOLATION HOSPITAL,
Beacon Park-road, PLYMOUTH.

Applications are invited from registered medical practitioners (unmarried, Male) for the appointment of ASSISTANT MEDICAL OFFICER (B1) at Swilly Isolation Hospital, Plymouth, which is for a period of six months, mutually renewable for a further similar period, terminable by one month's notice on either side. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The salary will be at the rate of £300 per annum, plus a bonus valued at £15 12s. per annum, with full residential emoluments, and any fees received by the officer must be refunded to the Council. The successful candidate will be required to work under the direction of the Medical Superintendent, and will devote the whole of his time to official duties, which will consist mainly of work in the Hospital and assisting at certain venereal diseases clinics. (He should be able to drive a car.) In addition to the above, he will be required to perform any other duties allotted to him from time to time by the Medical Officer of Health.

Applications, stating age, qualifications, and experience, together with copies of not more than three recent testimonials, must reach the undersigned as soon as possible.

T. PEIRSON, Medical Officer of Health.

Beaumont House, Beaumont Park, Plymouth.

Bedford County Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A post), to become vacant the middle of January including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the SECRETARY, Honorary Medical Staff Committee, as soon as possible.

Harrogate Royal Bath Hospital.

(National Hospital for Rheumatic Diseases.)
(Normal complement, 146 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of a HOUSE SURGEON (A), to become vacant in January, 1942, including R practitioners within three months of qualification. The appointment is for six months. Salary at the rate of £200 per annum, with full residential emoluments. Special facilities for study and research (thesis).

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, to be sent to the undersigned. E. P. L. DIXON, M.A.

Harrogate Royal Bath Hospital, Harrogate.

Huddersfield Royal Infirmary.

(321 Beds.)

Male HOUSE SURGEON (A) required to commence duty on 14th January, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months, otherwise is subject to renewal for a similar period of six months. Salary £150 per annum, with board, residence, and laundry. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England.

Applications, with copies of three recent testimonials, to be addressed to the undersigned.

H. J. JOHNSON, General Superintendent and Secretary.

Worthing Hospital.

Applications are invited from registered medical practitioners, Male or Female for the appointment of a HOUSE SURGEON (A) and HOUSE PHYSICIAN (A), which became vacant on the 20th December, including R practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

Worthing Hospital. A. V. OAKTON, House Governor.

Bristol Royal Hospital

(incorporating Bristol Royal Infirmary and Bristol General Hospital)
AND COSSHAM MEMORIAL HOSPITAL.

Applications are invited for the following resident appointments for the six months commencing 1st March, 1942 :—
Six HOUSE PHYSICIANS.
One HOUSE PHYSICIAN to the SKIN AND RADIOLOGICAL DEPARTMENT.
Nine HOUSE SURGEONS.
Two HOUSE SURGEONS to the GYNÆCOLOGICAL DEPARTMENT.
Three HOUSE SURGEONS to the CASUALTY DEPARTMENT.
Two HOUSE SURGEONS to the E.N.T. DEPARTMENT.
One HOUSE SURGEON to the OUT-PATIENT FRACTURE DEPARTMENT.
One HOUSE SURGEON to the IN-PATIENT FRACTURE DEPARTMENT.

Salaries at the rate of £80 per annum plus £20 per annum war bonus, except in the case of the Casualty House Surgeons who will receive salaries at the rate of £150 per annum plus £20 per annum war bonus and the two House Surgeons for Cossham Memorial Hospital who will receive salaries at the rate of £150 per annum.

Candidates, who must be registered medical practitioners, to send in their applications (on forms to be obtained from the undersigned) on or before 17th January, together with copies of not more than three testimonials. The elected candidates must become members of a Medical Defence Association before taking up their appointments.

All the above are A posts with the exception of the Casualty House Surgeons, which are B1 posts. R practitioners within three months of qualification may apply for the A posts when appointment will be for a period of six months, and suitably qualified R practitioners holding B2 or B1 posts may apply for the B1 posts.

ELLIS C. SMITH, F.C.I.S.,
Bristol Royal Infirmary. Secretary and House Governor.

General Hospital, Nottingham.

(495 Beds + 75 M.S. Beds.)

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, for the appointment of RESIDENT CASUALTY OFFICER (A) for the above Hospital. Duties to commence on 24th January. The appointment is for six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.

HENRY M. STANLEY, House Governor and Secretary.

General Hospital, Nottingham.

(Total 570 Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of a HOUSE SURGEON (A) for the above Hospital. The appointment is for six months. Duties to commence on 24th January. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.

HENRY M. STANLEY, House Governor and Secretary.

Kettering and District General Hospital.

APPOINTMENT OF A HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners for the appointment of a House Physician (A), including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

G. W. JACKSON, Secretary-Superintendent.

Chelmsford and Essex Hospital,

London-road, CHELMSFORD, ESSEX.
(235 Beds.)

Applications are invited for the post of CASUALTY OFFICER AND RESIDENT ANÆSTHETIST (A), Male or Female. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary £150 per annum, plus board, lodging, and laundry.

Apply, with recent testimonials, to the undersigned immediately.

R. G. MORRISH, House Governor and Secretary.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the appointments of :

OBSTETRICAL HOUSE SURGEON (B2).
GYNÆCOLOGICAL HOUSE SURGEON (B2),

to become vacant on 1st February, 1942, for six months. The salaries to be at the rate of £75 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 12th January, 1942.

A. R. WISE, Superintendent and Secretary.

City and County of Newcastle upon Tyne.

NEWCASTLE GENERAL HOSPITAL. (900 Beds.)
SHOTLEY BRIDGE HOSPITAL. (900 Beds.)

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners for the above appointments, including R practitioners within three months of qualification. The appointments will be tenable for a period of six months. Salary £150 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

City and County of Newcastle upon Tyne.

NEWCASTLE GENERAL HOSPITAL.

Applications are invited from registered medical practitioners for the post of Whole-time TEMPORARY REGISTRAR (B1) in the NEUROSURGICAL DEPARTMENT, now vacant. Applicants should have held previous surgical house appointments. Suitably qualified R practitioners holding B1 or B2 appointments are invited to apply. Salary £350 per annum, together with the usual residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

East Suffolk and Ipswich Hospital, Ipswich.

(400 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1) to this Hospital and Medical Superintendent to the Branch Hospital (50 Beds), vacant on 10th March, 1942. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The minimum salary is £350 or according to qualifications and experience.

Applications, stating age, nationality, qualifications with dates, experience and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned. ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 27th December, 1941.

Kent County Council.

Applications are invited from registered medical practitioners for the appointment of TEMPORARY RESIDENT ASSISTANT SURGEON (B1) at the ROYAL VICTORIA HOSPITAL, Folkestone. Applicants should have held house appointments and had surgical experience. The possession of higher surgical qualifications will be considered an advantage. Suitably qualified resident R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £550 a year, with full residential emoluments. Existing superannuation rights can be safeguarded.

Applications, stating age, qualifications, experience, and nationality, should be sent to the County Medical Officer, County Hall, Maidstone, not later than 20th January, 1942.

W. L. PLATTS, Clerk of the County Council.

County Hall, Maidstone, 24th December, 1941.

Chesterfield and North Derbyshire Royal Hospital.

(460 Medical and Surgical Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of a HOUSE SURGEON (A), to commence immediately, for a period of six months. Salary £150 per annum, with full residential emoluments. The successful applicant will be required to reside in and also carry out duty at the Hospital Annexe (80 Beds).

Applications, stating nationality, age, and qualifications with dates, together with copies of three recent testimonials, should be sent to the undersigned as soon as possible.

M. H. BOONE, House Governor and Secretary.

29th December, 1941.

Municipal General Hospital, Burnley.

(250 Beds.)

APPOINTMENT OF JUNIOR RESIDENT MEDICAL OFFICER (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment (A), which is now vacant, including R practitioners within three months of qualification. If held by an R practitioner, appointment will be for a period of six months; otherwise it will be for a period of twelve months. Salary is at the rate of £150 per annum for the first six months and £200 per annum for the second six months, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, 27, St. James's-street, Burnley, as soon as possible.

Hull Corporation Health Department.

BEVERLEY ROAD INSTITUTION AND HOSPITAL.

AMENDED ADVERTISEMENT.

Applications are invited from Male registered medical practitioners for the appointment of Temporary MEDICAL OFFICER at the Beverley Road Institution and Hospital. The appointment will, in the first instance, be a temporary one, subject to review at the end of the war. Administrative experience in a Public Assistance or General Hospital essential. Salary will be at the rate of £800 per annum, together with unfurnished house.

Full particulars and forms of application may be obtained from the MEDICAL OFFICER OF HEALTH, Guildhall, Hull, and completed applications should be returned to him not later than 10 A.M. on Monday, the 26th January, 1942.

Hull Corporation Health Department.

HULL CITY HOSPITAL AND SANATORIUM.

Applications are invited for the appointment of a Temporary RESIDENT MEDICAL OFFICER (B1) at the Hull Sanatorium, Cottingham.

The appointment is open to registered medical practitioners of either sex, who must be single and have had experience in general hospital work. Possession of the Diploma in Public Health, or similar qualification, and previous experience in a sanatorium or fever hospital will be regarded as additional qualifications. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

The appointment is for a period of one year and the salary is £350 per annum, together with board, laundry, and residence. The appointment may be extended for more than one year, in which case the salary, subject to satisfactory service, will be increased by annual increments of £25 to a maximum of £450 per annum.

Application forms may be obtained from, and should be returned to, the MEDICAL OFFICER OF HEALTH, Guildhall, Hull, not later than Wednesday, the 28th January, 1942.

Keighley County Hospital,

KEIGHLEY, YORKS.

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B2). R practitioners who now hold A posts may apply when appointment will be limited to six months; otherwise it will be for a period of six months and renewable thereafter for a further six months. Salary is at the rate of £200 per annum, plus board and lodging valued at £100 per annum.

Applications, stating age, qualifications with dates, nationality, and present position, and accompanied by copies of not more than three recent testimonials, should be sent to the CLERK OF THE COUNTY COUNCIL, County Hall, Wakefield, by not later than the 24th January, 1942.

Children's Hospital, Nottingham.

Applications are invited for the post of HOUSE PHYSICIAN AND CASUALTY OFFICER (B2) (Woman). There are two other Residents and the duties will include some surgical ward work. Experience in anæsthetics desirable. The salary will be at the rate of £220 per annum, with apartments, board, and laundry. The appointment will be for six months, duties to commence on the 1st March, 1942.

Applications, together with testimonials, stating age, nationality, qualifications, and experience, to be sent to the HONORARY SECRETARY, 1, King John's Chambers, Bridlesmith Gate, Nottingham, on or before Tuesday, 20th January, 1942. Selected candidates will be required to attend at the Hospital for a personal interview.

Keighley and District Victoria Hospital,

YORKSHIRE (WEST RIDING).

(Beds: 140 Normal, 54 M.S.—Two Residents.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of SECOND RESIDENT MEDICAL OFFICER (A), vacant on 1st February. Salary £120 per annum, with full residential emoluments. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise it will be for six months renewable, with a salary of £140 if renewed.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be received by the undersigned not later than 19th January, 1942. J. YOUNG, Secretary-Superintendent.

Walsall General Hospital.

Applications are invited from registered medical practitioners for the appointment of a HOUSE PHYSICIAN (A), to become vacant on the 1st March, 1942, including R practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be forwarded to the undersigned not later than the 31st January, 1942.

R. C. MILLWARD, House Governor.

City of Manchester.

CRUMPSALL HOSPITAL. (1400 Beds.)
(Recognised under the Regulations for the F.R.C.S.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT ASSISTANT SURGICAL OFFICER (B1) at the above-mentioned Class 1A M.S. Hospital.

Suitably qualified R practitioners, preferably with orthopædic experience, holding B2 or B1 appointments are invited to apply.

The basic salary for the appointment commences at £350 per annum, rising by annual increments of £25 to a maximum of £450, together with full residential emoluments. A temporary cost-of-living award is payable in addition to the foregoing salary. The appointment is subject to the Manchester Corporation conditions of service.

Full information and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2, and applications for the post must be received by him not later than 26th January, 1942.

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 3rd January, 1942.

North Staffordshire Royal Infirmary,

STOKE-ON-TRENT. (472 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT ORTHOPÆDIC OFFICER (B1), which will shortly become vacant. Applicants should have had previous experience and be suitably qualified R practitioners holding B2 or B1 appointments. Preference will be given to candidates holding the Fellowship Diploma of one of the Royal Colleges of Surgeons. The Orthopædic Department serves a large industrial district and the post offers exceptional experience in traumatic surgery. The appointment will be for a period of one year in the first instance. Salary is at the rate of £350 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

THORNBURROW GIBSON, Secretary and House Governor.

City and County of Bristol.

DEPARTMENT OF PUBLIC HEALTH.

HAM GREEN HOSPITAL AND SANATORIUM.

Applications are invited from registered medical practitioners for the appointment of ASSISTANT RESIDENT MEDICAL OFFICER (B2), for a minimum period of six months. Applicants should have held house appointments. Applicants can include R practitioners who now hold A posts when appointment will be limited to six months. Salary is at the rate of £200 per annum, with full residential emoluments. The Hospital has the following Beds: 340 Fever, 160 Tuberculosis.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than the 15th January, 1942.

R. H. PARRY, Medical Officer of Health.

Kenwith Lodge, Westbury Park, Bristol, 6.

Cheshire County Mental Hospital,

PARKSIDE, MACCLESFIELD.

Temporary Male ASSISTANT MEDICAL OFFICER required, single, ineligible for war service. Previous mental hospital experience not essential. Salary £8 8s. per week, with board, apartments, and laundry. Preference will be given to candidate with laboratory experience.

Applications, stating qualifications, with copies of three recent testimonials, to be sent to the MEDICAL SUPERINTENDENT, to be received as soon as possible.

The Royal Infirmary, Sunderland.

Applications are invited from Male or Female registered medical practitioners, including R practitioners within three months of qualification, for the appointment of HOUSE PHYSICIAN (A), to become vacant on the 17th February, 1942. The appointment will be limited to six months. The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at the earliest possible date.

M. J. HUNTLEY, House Governor and Secretary.

Lincoln County Hospital.

Applications are invited from registered medical practitioners (Male, unmarried), including R practitioners within three months of qualification, for the appointment of HOUSE SURGEON (A). The appointment is for six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, nationality, medical school, and qualifications with dates, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

ARTHUR MOORE, Secretary-Superintendent.

Lincoln, 3rd January, 1942.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Editorial Office Address, 26, Temple Street, Aylesbury, Bucks (Aylesbury 315).
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, January 10, 1942.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

County Borough of Rotherham.

OAKWOOD HALL SANATORIUM.

Applications are invited from registered medical practitioners (Male or Female, unmarried) for the post of TEMPORARY ASSISTANT MEDICAL OFFICER (B1). Previous experience in the treatment of tuberculosis, while being an additional qualification, is not regarded as essential. Suitably qualified R practitioners holding B2 or B1 posts may apply.

The duties are those of Resident Medical Officer at Oakwood Hall Sanatorium (100 Beds), together with other work as required at the Fever Hospital or in other departments.

The salary is £350 per annum, together with a bonus at present amounting to £19 16s. per annum, and with board, residence, and laundry. The bonus is subject to alteration or cancellation by the Council. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and is terminable at any time by two month's notice on either side.

Forms of application may be obtained from the Medical Officer of Health, Municipal Offices, Rotherham, and must be returned to the undersigned, endorsed "Assistant Medical Officer, Oakwood Hall Sanatorium," not later than NOON on 22nd January, 1942.

Canvassing will be deemed a disqualification.

CHAS. L. DES FORGES, Town Clerk.

Municipal Offices, Rotherham, 31st December, 1941.

King Edward VII Hospital, Windsor.

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A). R practitioners within three months of qualification may apply when the appointment will be for a period of six months from 1st February. The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, together with copies of three recent testimonials, should be sent to the undersigned by 12th January, 1942.

GEORGE WESTON, Secretary.

Nottingham City Hospital.

APPOINTMENT OF JUNIOR HOUSE PHYSICIAN (A POST), RESIDENT.

Applications are invited from registered medical practitioners for the above appointment, including R practitioners within three months of qualification. The appointment will be tenable for a period of six months and is terminable by one month's notice on either side. The salary will be £250 per annum, with board and residence.

Applications, with full particulars of qualifications, &c., should be made forthwith to the undersigned.

J. E. RICHARDS, Town Clerk.

Guildhall, Nottingham, 30th December, 1941.

Royal Berkshire Hospital, Reading.

Applications are invited from registered medical practitioners (Male) for the appointment of RESIDENT ANÆSTHETIST (B2), now vacant, including R practitioners who now hold A posts. The appointment is for six months. A salary of £250 per annum, with board, residence, and laundry, will be paid to the candidate possessing suitable qualifications for the post.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. E. RYAN, Secretary and House Governor.

Calderstones Hospital, Whalley,

near BLACKBURN.

Applications are invited from registered medical practitioners, Male, for the appointment of HOUSEMAN (Medical or Surgical) (A post) to become vacant immediately, including R practitioners within three months of qualification, when appointment will be for a period of six months, otherwise it will be for a period of six months in the first instance. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL SUPERINTENDENT as soon as possible.

Torbay Hospital, Torquay, Devon.

(223 Beds.)

RESIDENT HOUSE PHYSICIAN (A) wanted for about 1st February, 1942. R practitioners within three months of qualification may apply when appointment will be limited to six months. Salary £125 per annum.

Age, nationality, qualifications, and testimonials to SECRETARY, Torbay Hospital, Torquay.

Papworth Village Settlement.

(520 Beds.)

Applications are invited for the appointment of an ASSISTANT MEDICAL OFFICER (B1), at a salary of £300 per annum, with board and residence, for a period of six months in the first place.

Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply, stating age, qualifications, sex, and nationality, and accompanied by copies of three recent testimonials, which should be sent to the CHIEF MEDICAL OFFICER, Papworth Village Settlement, Papworth Hall, Cambridge.

Saint Mary's Hospitals,

MANCHESTER, 13.

Applications are invited for the post of Resident Medical Officer (B1) to the Hospitals' Private Patients Maternity Branch at Adlington Hall, Cheshire. Preference will be given to candidates holding the Membership or Diploma of the Royal College of Obstetricians and Gynæcologists. Suitably qualified R practitioners holding B2 or B1 posts may apply. Salary at the rate of £200 per annum, with board, residence and laundry.

Applications should be sent to the undersigned not later than 20th January, 1942.

A. R. WISE, Superintendent and Secretary.

District Infirmary, Ashton-under-Lyne.

(200 Beds, mainly surgical.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT CASUALTY OFFICER (B2), to become vacant immediately. R practitioners holding A posts may apply when appointment will be limited to six months. The salary is at the rate of £180 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

FRANK OLIVER, General Superintendent and Secretary.

Kent and Canterbury Hospital,

CANTERBURY. (4 R.M.O.'s—322 Beds.)

Applications are invited from Male registered medical practitioners for the appointment of a HOUSE SURGEON (B2) vacant now. R practitioners who now hold A posts may apply, when appointment will be limited to six months. The salary is at the rate of £125 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

J. F. KENT, Superintendent and Secretary.

6th January, 1942.

Pontefract General Infirmary

AND THE HYDES HOSPITAL. (112 Beds.)

Applications are invited from registered medical practitioners, Male, for the appointment of a HOUSE SURGEON (A), to become vacant immediately, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

D. J. RICHARDS, Secretary-Superintendent.

Royal Hampshire County Hospital,

WINCHESTER. (461 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the appointment of HOUSE PHYSICIAN (A). The appointment will be for a period of six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. EWART MITCHELL, Superintendent and Secretary.

Prison Service—Medical Staff.

A vacancy exists for a Woman MEDICAL OFFICER at H.M. Prison, Holloway, to assist the other Medical Officers in a temporary capacity. The appointment is a part-time one—i.e., the holder undertakes its duties and responsibilities in conjunction with her private practice—and is not pensionable. The salary is £350 a year, inclusive.

Forms of application may be obtained from the PRISON COMMISSIONERS (Staff Branch), Oriel College, Oxford.

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